Wynn Resort in Everett

Everett, Massachusetts

Supplemental Final Environmental Impact Report

VOLUME II

EOEEA #15060

February 17, 2015

submitted to **Executive Office of Energy and Environmental Affairs**

submitted by **Wynn MA, LLC**

prepared by **Fort Point Associates, Inc.**

in association with **Dirigo Group**
Wynn Design & Development, LLC
Lifescapes International, Inc.
RD Vanasse & Associates Inc.
GZA GeoEnvironmental, Inc.
Howard/Stein-Hudson Associates, Inc.
Norris & Norris Associates
Novus Environmental
Tech Environmental
Federal Airways & Airspace

WYNN RESORTS

Fort Point Associates, Inc.
Urban Planning · Environmental Consulting · Project Permitting

Fort Point Associates, Inc.
Urban Planning *Environmental Consulting* *Project Permitting*

February 17, 2015

Re: Wynn Resort in Everett
Supplemental Final Environmental Impact Report
EEA# 15060

Dear Reviewer:

We are pleased to submit the Supplemental Final Environmental Impact Report (SFEIR) for Wynn Resort in Everett (the "Project") on behalf of Wynn MA, LLC. This document has been prepared to describe the proposed three million square foot hotel/resort and gaming facility to be located at 1 Horizon Way in Everett, Massachusetts.

The SFEIR describes the elements of the project in great detail, including potential environmental impacts and proposed mitigation measures to be provided in response to the Certificate of the Secretary of Energy and Environmental Affairs on the Final Environmental Impact Report, which was issued on August 15, 2014. The SFEIR also describes the benefits that the Project will bring to the City of Everett, the region and the Commonwealth of Massachusetts.

Comments regarding this document should be directed no later than March 27, 2015 to:

Matthew Beaton
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office/ MEPA Reviewer
100 Cambridge Street, Suite 900
Boston, MA 02114

Printed copies of this SFEIR are available at local libraries, and copies may be obtained from Fort Point Associates at the address listed below, or by contacting me at: jkohn@fpa-inc.com.

Sincerely,

Judith T. Kohn, RLA
Senior Project Manager
Fort Point Associates, Inc.

Cc. Jacqui Krum, Wynn MA, LLC
encl. Wynn Everett SFEIR

Wynn Resort in Everett

Everett, Massachusetts

Supplemental Final Environmental Impact Report

EOEEA #15060
February 17, 2015

submitted to
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

submitted by
Wynn MA, LLC
3131 Las Vegas Boulevard South
Las Vegas, Nevada 89109

Appendix A

Distribution List

APPENDIX A: DISTRIBUTION LIST

STATE AGENCIES AND GOVERNMENT ORGANIZATIONS

Secretary of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

MassDEP
Commissioner's Office
One Winter Street
Boston, MA 02108

MassDEP Northeast Regional Office
Attn: Environmental Reviewer
205B Lowell Street
Wilmington, MA 01887

MassDEP, Waterways Program
Attn: Ben Lynch
One Winter Street
Boston, MA 02108

MassDEP
Attn: John D. Viola, Deputy Regional Director
One Winter Street
Boston, MA 02108

Massachusetts Historical Commission
Attn: Brona Simon, Executive Director
220 Morrissey Boulevard
Boston, MA 02125

Massachusetts Department of Transportation
Public Private Development Unit
Ten Park Plaza
Boston, MA 02116

Massachusetts Department of Transportation
Attn: David J. Mohler, Executive Director
Office of Transportation Planning
Ten Park Plaza, Suite 4160
Boston, MA 02116

MassDOT– Highway Division District #4
Attn: Environmental Reviewer
519 Appleton Street
Arlington, MA 02476

Metropolitan Area Planning Council
Attn: Marc Draisen, Executive Director
60 Temple Place, 6th floor
Boston, MA 02111

Office of Coastal Zone Management
Attn: Bruce Carlisle, Director
251 Causeway Street, Suite 800
Boston, MA 02114

Massachusetts Department of Conservation and Recreation
Attn: John P. Murray
251 Causeway Street, Suite 600
Boston, MA 02114

Massachusetts Division of Marine Fisheries
Attn: Paul J. Diodati
251 Causeway Street, Suite 400
Boston, MA 02114

Massachusetts Bay Transportation Authority
Attn: MEPA Coordinator
10 Park Plaza, 6th Floor
Boston, MA 02116-3966

Massachusetts Gaming Commission
Attn: John Ziemba
84 State Street, 10th Floor
Boston, MA 02109

Board of Underwater Archaeological Resources
Attn: Victor T. Mastone, Director
251 Causeway Street, Suite 800
Boston, MA 02114

Massachusetts Department of Energy Resources
Attn: John Ballam, Manager of Engineering & CHP Program
100 Cambridge Street, Suite 1020
Boston, MA 02114

Massachusetts Port Authority
Attn: James Doolin, Chief Development Officer
One Harborside Drive, Suite 200S
East Boston, MA 02128

Massachusetts Water Resources Authority
Attn: Marianne Connolly, Senior Program Manager, Environmental Review and Compliance
100 First Avenue
Charlestown, MA 02129

CITY OF EVERETT

Office of the Mayor
Attn: Melissa Murphy Rodrigues, Chief of Staff
Everett City Hall
484 Broadway, Room 31
Everett, MA 02149

Everett Board of Aldermen
Attn: Joseph McGonagle, Alderman At-Large
46 Corey Street
Everett, MA 02149

Everett Dept. of Planning & Development
Attn: James Errickson, Executive Director
Everett City Hall
484 Broadway, Room 25
Everett, MA 02149

Everett Conservation Commission
Attn: Jon Norton, Chairman
Everett City Hall
484 Broadway, Room 40
Everett, MA 02149

Everett Public Health Department
Attn: Roberto Santamaria, Director
Everett City Hall
484 Broadway, Room 20
Everett, MA 02149

Everett Department of City Services
Everett City Hall
484 Broadway
Everett, MA 02149

OTHER MUNICIPALITIES

City of Boston

Salvatore LaMattina
Boston City Councilor
1 City Hall Plaza
Boston, MA 02201

Boston Redevelopment Authority
Attn: MEPA Reviewer
1 City Hall Plaza
Boston, MA 02201

Boston Parks and Recreation Department
Attn: Antonia M. Pollak, Commissioner
1010 Massachusetts Avenue
Boston, MA 021 18

Boston Transportation Department
Thomas J. Tinlin, Commissioner
1 City Hall Plaza, Room 721
Boston, MA 02201

Boston Environment Department
Brian Swett, Chief of Environment and Energy
1 City Hall Plaza, Room 603
Boston, MA 02201

Host Community Advisory Committee
Attn: Elizabeth Dello Russo, Executive Director
1 City Hall Plaza
Boston, MA 02201

City of Chelsea

Jay Ash, City Manager
City Hall, Room #302
500 Broadway
Chelsea, MA 02150

City of Malden

Gary Christenson, Mayor
200 Pleasant Street, Room 627
Malden, MA 02148

City of Somerville

Department of Strategic Planning and Community Development
Somerville City Hall
93 Highland Avenue
Somerville, MA 02143

Mayor Joseph Curtatone
Somerville City Hall
93 Highland Avenue
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220A Summer St.
Somerville, MA 02143
617 594-8347

City of Medford

Office of Community Development
Attn: Lauren DiLorenzo, Director
Ci ty Hall, Room 308
85 George P. Hassett Drive
Medford, MA 02155

Department of Public Works
Attn: Paul Gere, Commissioner
City Hall, Room 304
85 George P. Hassett Drive
Medford, MA 02155

Mayor Michael McGlynn
Rooms 202-204, City Hall
85 George P. Hassett Drive
Medford, MA 02155

Medford Office of Energy & Environment
Attn: Alicia Hunt, Director
City Hall Room 205
85 George P. Hassett Drive
Medford, MA 02155

City of Medford Police Department
Attn: Leo A. Sacco, Jr., Chief of Police
100 Main Street
Medford, Massachusetts 02155

City of Medford Fire Department
Attn: Frank A. Giliberti, Jr., Chief
120 Main Street
Medford, MA 02155

City of Revere

Department of Planning and Community Development
Attn: Frank Stringi, Director
281 Broadway
Revere, MA 02151

ELECTED OFFICIALS

Senator Sal N. DiDomenico
State House Room 218
Boston, MA 02133

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Representative Kathi-Anne Reinstein
State House Room 481
Boston, MA 02133

ORGANIZATIONS

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Malden, MA 02148

Boston Harbor Islands Alliance
Attn: Jane Ellis, VP for Operations
15 State Street, Suite 1100
Boston, MA 02109

MassAudubon
Attn: Christina McDermott, Assistant to the Director of Public Policy & Government Relations
6 Beacon Street, Suite 1025
Boston, MA 02108

Charlestown Mothers Association
Attn: Jennifer Rossi, Co-President
Jennifer Rossi [jennifer.m.rossi@gmail.com]

Charlestown Waterfront Coalition
P.O. Box 290533
Charlestown, Massachusetts 02129

Charlestown Neighborhood Council
Attn: Mark Rosenshein
32 Green Street
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markrosenshein@comcast.net

Gardens for Charlestown, Inc.
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jshipe@columbiadesigngroup.com

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Charlestown, MA 02129

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jellis@islandalliance.org

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40 Woodward Street
Everett. MA 02149

Mystic River Watershed Association
Attn: EkOngKar Singh Khalsa, Executive Director
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Arlington, MA 02476

Rutherford Corridor Improvement Coalition
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rcic@rcic-charlestown.org

The Boston Harbor Association
Attn: Vivien Li, President
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Attn: Wendy Landman, Executive Director
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PUBLIC LIBRARIES

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410 Broadway
Everett, MA 02149

Shute Memorial Library
781 Broadway
Everett, MA 02149

Malden Public Library
36 Salem Street
Malden, MA 02148

Boston Public Library, Charlestown Branch
179 Main Street
Charlestown, MA 02129

Medford Public Library
111 High Street
Medford, MA 02155

Chelsea Public Library
569 Broadway
Chelsea, MA 02150

Somerville Public Library
79 Highland Avenue
Somerville, MA 02143

Appendix B

TRANSPORTATION APPENDIX

Appendix B

B1. Trip Generation
- a. Detailed Trip Generation Worksheets
- b. Truck Trip Generation

B2. Lower Broadway/Alford Street (Route 99), Everett/Boston
- a. Synchro and SimTraffic Output Reports
  - i. Existing (2014) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
  - ii. No-Build (2023) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
  - iii. Build (2023) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
    3. Friday p.m. "Real" Peak Hour
  - iv. Build (2023) Mitigated Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
    3. Friday p.m. "Real" Peak Hour
- b. VISSIM Output Reports

B3. Santilli Circle, Everett

a. Synchro and SimTraffic Output Reports
   i. Existing (2013) Conditions
      1. Friday p.m. Peak hour
      2. Saturday Afternoon Peak Hour
   ii. No-Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
   iii. Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour
   iv. Build (2023) Mitigated Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour

b. VISSIM Output Reports

B4. Sweetser Circle, Everett

a. SIDRA Output Reports
   i. Existing (2013) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
   ii. No-Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
   iii. Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour
   iv. Build (2023) Mitigated Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour

b. VISSIM Output Reports

B5. Revere Beach Parkway (Route 16), Chelsea

a. Synchro Output Reports

i. Existing (2013) Conditions

1. Friday p.m. Peak Hour
2. Saturday Afternoon Peak Hour

ii. No-Build (2023) Conditions

1. Friday p.m. Peak Hour
2. Saturday Afternoon Peak Hour

iii. Build (2023) Conditions

1. Friday p.m. Peak Hour
2. Saturday Afternoon Peak Hour
3. Friday p.m. “Real” Peak Hour

iv. Build (2023) Mitigated Conditions

1. Friday p.m. Peak Hour
2. Saturday Afternoon Peak Hour
3. Friday p.m. “Real” Peak Hour

B6. Bell Circle, Revere

a. Synchro Output Reports
   - i. Existing (2013) Conditions
     1. Friday p.m. Peak Hour
     2. Saturday Afternoon Peak Hour
   - ii. No-Build (2023) Conditions
     1. Friday p.m. Peak Hour
     2. Saturday Afternoon Peak Hour
   - iii. Build (2023) Conditions
     1. Friday p.m. Peak Hour
     2. Saturday Afternoon Peak Hour
     3. Friday p.m. "Real" Peak Hour
   - iv. Build (2023) Mitigated Conditions
     1. Friday p.m. Peak Hour
     2. Saturday Afternoon Peak Hour
     3. Friday p.m. "Real" Peak Hour

B7. Wellington Circle and Select Intersections, Medford

a. Synchro Output Reports
  i. Existing (2013) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
  ii. No-Build (2023) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
  iii. Build (2023) Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
    3. Friday p.m. "Real" Peak Hour
  iv. Build (2023) Mitigated Conditions
    1. Friday p.m. Peak Hour
    2. Saturday Afternoon Peak Hour
    3. Friday p.m. "Real" Peak Hour

b. VISSIM Output Reports

B8. Sullivan Square/Rutherford Avenue, Boston

a. Synchro Output Reports
   i. Existing (2014) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
   ii. No-Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
   iii. Build (2023) Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour
   iv. Build (2023) Mitigated Conditions
      1. Friday p.m. Peak Hour
      2. Saturday Afternoon Peak Hour
      3. Friday p.m. "Real" Peak Hour

b. VISSIM Output

B9. Parking Analysis

a. Shared Parking Analysis Worksheets

b. Parking Demand Tables

B10. Transit Analysis

a. Orange Line Load Capacity Analysis

b. Bus Route Load Capacity Analysis

B11. Loading Dock

a. Autoturn Analysis

B.1 Trip Generation

a. Detailed Trip Generation Worksheets
b. Truck Trip Generation

Detailed Trip Generation Worksheets

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
January 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

Component	Size	Category	Vehicle Trips per unit		Unadjusted Vehicle Trips	National vehicle occupancy rate[1]	Person Trips	Proportion of work vs. non-work trips (see footnote 6): work	non-work	total	Employee person trips	Patron Person Trips
FRIDAY DAILY								work	non-work	total		
Hotel	629	Total	8.36	9.37	5,256		10,733				1,586	9,148
see footnote 2	rooms	In	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
		Out	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
Night Club/Lounge	0.0	Total	56.70		0		0				0	0
see footnote 3	KSF	In	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
Retail (shopping center)	66.556	Total	78.31		5,212		10,631				1,592	9,040
see footnote 4	KSF	In	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
		Out	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
Restaurant	0.00	Total	89.95		0		0				0	0
	KSF	In	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
Gaming	4,142	Total	9.06				37,512				3,074	34,438
see footnote 5	positions	In	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
		Out	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
FRIDAY DAILY		Total					58,877				6,252	52,625
Total		In					29,438	10.6%	89.4%	100.0%	3,126	26,312
		Out					29,438	10.6%	89.4%	100.0%	3,126	26,312
FRIDAY PM PEAK								work	non-work	total		
Hotel	629	Total	0.61		384		783				0	756
see footnote 2	rooms	In	0.35		223	2.0	454	0.0%	100.0%	100.0%	0	454
		Out	0.26		161	2.0	329	8.3%	91.7%	100.0%	0	302
Night Club/Lounge	0.0	Total	11.30		0		0				0	0
see footnote 3	KSF	In	7.68		0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.62		0	2.1	0	5.6%	94.4%	100.0%	0	0
Retail (shopping center)	66.6	Total	6.85		456		930				0	677
see footnote 4	KSF	In	3.29		219	2.0	447	27.3%	72.7%	100.0%	0	325
		Out	3.56		237	2.0	484	27.3%	72.7%	100.0%	0	352
Restaurant	0.0	Total	9.02		0		0				0	0
0	KSF	In	5.59		0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.43		0	2.1	0	5.6%	94.4%	100.0%	0	0
Gaming	4,142	Total	0.66				2,728				0	2,728
see footnote 5	positions	In	0.33		686	2.0	1,372	0.0%	100.0%	100.0%	0	1,372
		Out	0.33		678	2.0	1,355	0.0%	100.0%	100.0%	0	1,355
FRIDAY PM PEAK		Total					4,441				0	4,160
Total		In					2,273	0.0%	100.0%	100.0%	0	2,151
		Out					2,168	0.0%	100.0%	100.0%	0	2,009

Employees

Component / Category	Employee Person Trips	Employee Public Transit ORANGE LINE: Share	Person trips	Employee Public Transit - MBTA BUS: Share	Person trips	Patron Park and Ride Bus (LEX Model): Share	Person trips	AVO of Tour Bus	Tour Buses	Employee Water Transportation: Share	Person trips	Employee Walk/Bicycle: Share	Person trips	Employee Auto: Share	Person trips	Auto AVO	Autos	Employee Shuttle Ridership – Employees boarding/alighting at neighborhood stops: Share	Person Trips	Employees boarding/alighting at remote parking facilities: Person Trips	Total Ridership: Person Trips
FRIDAY DAILY		20%		10%		3%				3%		3%		41%		1.13		20%			
Hotel In	793	20%	159	10%	79	3%	24	included with patrons		3%	24	3%	24	41%	325	1.13	288	20%	159	325	484
Hotel Out	793	20%	159	10%	79	3%	24			3%	24	3%	24	41%	325	1.13	288	20%	159	325	484
Night Club/Lounge In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	41%	0	13	0	20%	0	0	0
Night Club/Lounge Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	41%	0	13	0	20%	0	0	0
Retail (shopping center) In	796	20%	159	10%	80	3%	24	included with patrons		3%	24	3%	24	41%	326	1.13	289	20%	159	326	486
Retail (shopping center) Out	796	20%	159	10%	80	3%	24			3%	24	3%	24	41%	326	1.13	289	20%	159	326	486
Restaurant In	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Restaurant Out	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Gaming In	1537	20%	307	10%	154	3%	46	included with patrons		3%	46	3%	46	41%	630	1.13	558	20%	307	630	938
Gaming Out	1537	20%	307	10%	154	3%	46			3%	46	3%	46	41%	630	1.13	558	20%	307	630	938
FRIDAY DAILY Total	6252		1250		625		188				188		188		2563		2270		1250	2563	3814
FRIDAY DAILY In	3126		625		313		94				94		94		1282		1135		625	1282	1907
FRIDAY DAILY Out	3126		625		313		94				94		94		1282		1135		625	1282	1907
FRIDAY PM PEAK	0%	Percent of estimated peak hour employee trips that will be permitted to occur during Friday pm peakhour																			
Hotel In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Hotel Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Night Club/Lounge In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Night Club/Lounge Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Retail (shopping center) In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Retail (shopping center) Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Restaurant In	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Restaurant Out	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Gaming In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
Gaming Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	0%	0	1.13	0	20%	0	0	0
FRIDAY PM PEAK Total	0		0		0		0				0		0		0		0		0	0	0
FRIDAY PM PEAK In	0		0		0		0				0		0		0		0		0	0	0
FRIDAY PM PEAK Out	0		0		0		0				0		0		0		0		0	0	0

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
Janaury 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

Component	Size	Category	Vehicle Trips per unit	Unadjusted Vehicle Trips	National vehicle occupancy rate[1]	Person Trips	Proportion of work vs. non-work trips (see footnote 6): work	non-work	total	Employee person trips	Patron Person Trips
SATURDAY DAILY							work	non-work	total		
Hotel	629	Total	9.15	5756		11,754				1,736	10,018
see footnote 2	rooms	In	4.58	2878	2.0	5,877	15%	85.2%	100.0%	868	5,009
		Out	4.58	2878	2.0	5,877	15%	85.2%	100.0%	868	5,009
Night Club/Lounge	0.0	Total	142.85	0		0				0	0
see footnote 3	KSF	In	71.43	0	2.1	0	12.9%	87.1%	100.0%	0	0
		Out	71.43	0	2.1	0	12.9%	87.1%	100.0%	0	0
Retail (shopping center)	66.6	Total	107.42	7149		14,583				2,184	12,399
see footnote 4	KSF	In	53.71	3575	2.0	7,292	15.0%	85.0%	100.0%	1,092	6,200
		Out	53.71	3575	2.0	7,292	15.0%	85.0%	100.0%	1,092	6,200
Restaurant	0.0	Total	94.36	0		0				0	0
0	KSF	In	47.18	0	2.1	0	12.9%	87.1%	100.0%	0	0
		Out	47.18	0	2.1	0	12.9%	87.1%	100.0%	0	0
Gaming	4,142	Total	10.55			43,707				3,582	40,125
see footnote 5	positions	In	5.28	10,927	2.0	21,854	8.2%	91.8%	100.0%	1,791	20,063
		Out	5.28	10,927	2.0	21,854	8.2%	91.8%	100.0%	1,791	20,063
SATURDAY DAILY Total		Total				70,045				7,502	62,543
		In				35,022	10.7%	89.3%	100.0%	3,751	31,271
		Out				35,022	10.7%	89.3%	100.0%	3,751	31,271
SATURDAY PEAK HOUR							work	non-work	total		
Hotel	629	Total	0.70	438		895				33	862
see footnote 2	rooms	In	0.39	245	2.0	501	0.0%	100.0%	100.0%	0	501
		Out	0.31	193	2.0	394	8.3%	91.7%	100.0%	33	361
Night Club/Lounge	0.0	Total	16.38	0		0				0	0
see footnote 3	KSF	In	9.66	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	6.72	0	2.1	0	5.6%	94.4%	100.0%	0	0
Retail (shopping center)	66.6	Total	10.08	671		1,369				373	995
see footnote 4	KSF	In	5.24	349	2.0	712	27.3%	72.7%	100.0%	194	518
		Out	4.84	322	2.0	657	27.3%	72.7%	100.0%	179	478
Restaurant	0.0	Total	10.82	0		0				0	0
0	KSF	In	6.38	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	4.44	0	2.1	0	5.6%	94.4%	100.0%	0	0
Gaming	4,142	Total	0.79			3,255				14	3,117
see footnote 5	positions	In	0.38	789	2.0	1,578	0.9%	99.1%	100.0%	14	1,564
		Out	0.40	838	2.0	1,677	0.0%	100.0%	100.0%	0	1,554
SATURDAY PEAK HOUR Total		Total				5,519				420	4,975
		In				2,791	7.5%	92.5%	100.0%	208	2,583
		Out				2,728	8.1%	91.9%	100.0%	212	2,392

Employees

Component	Employee Person Trips	Employee Public Transit ORANGE LINE: Share	Person trips	Employee Public Transit - MBTA BUS: Share	Person trips	Patron Park and Ride Bus (LEX Model): Share	Person trips	AVO of Tour Bus	Tour Buses	Employee Water Transportation: Share	Person trips	Employee Walk/Bicycle: Share	Person trips	Employee Auto: Share	Person trips	Auto AVO	Autos	Employee Shuttle Ridership: Employees boarding/alighting at neighborhood stops: Share	Person Trips	Employees boarding/alighting at remote parking facilities: Person Trips	Total Ridership: Person Trips
SATURDAY DAILY																					
Hotel In	868	20%	174	10%	87	3%	26	included with patrons		3%	26	3%	26	41%	356	1.13	316	20%	174	356	530
Hotel Out	868	20%	174	10%	87	3%	26			3%	26	3%	26	41%	356	1.13	316	20%	174	356	530
Night Club/Lounge In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Night Club/Lounge Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Retail (shopping center) In	1092	20%	218	10%	109	3%	33	included with patrons		3%	33	3%	33	41%	448	1.13	397	20%	218	448	666
Retail (shopping center) Out	1092	20%	218	10%	109	3%	33			3%	33	3%	33	41%	448	1.13	397	20%	218	448	666
Restaurant In	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Restaurant Out	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Gaming In	1791	20%	358	10%	179	3%	54	included with patrons		3%	54	3%	54	41%	734	1.13	650	20%	358	734	1093
Gaming Out	1791	20%	358	10%	179	3%	54			3%	54	3%	54	41%	734	1.13	650	20%	358	734	1093
SATURDAY DAILY Total	7502		1500		750		225				225		225		3076		2726		1500	3076	4576
In	3751		750		375		113				113		113		1538		1363		750	1538	2288
Out	3751		750		375		113				113		113		1538		1363		750	1538	2288
SATURDAY PEAK HOUR	100%	Percent of estimated peak hour employee trips that will be permitted to occur during Saturday pm peak hour																			
Hotel In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Hotel Out	33	20%	7	10%	3	3%	1			3%	1	3%	1	41%	13	1.13	12	20%	7	13	20
Night Club/Lounge In	0	20%	0	10%	0	3%	0	included with patrons		3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Night Club/Lounge Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Retail (shopping center) In	194	20%	39	10%	19	3%	6	included with patrons		3%	6	3%	6	41%	80	1.13	71	20%	39	80	118
Retail (shopping center) Out	179	20%	36	10%	18	3%	5			3%	5	3%	5	41%	73	1.13	66	20%	36	73	109
Restaurant In	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Restaurant Out	0	20%	0	10%	0					3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
Gaming In	14	20%	3	10%	1	3%	0	included with patrons		3%	0	3%	0	41%	6	1.13	6	20%	3	6	9
Gaming Out	0	20%	0	10%	0	3%	0			3%	0	3%	0	41%	0	1.13	0	20%	0	0	0
SATURDAY PEAK HOUR Total	420		84		42		13				13		13		172		155		84	172	256
In	208		42		21		6				6		6		85		77		42	85	127
Out	212		42		21		6				6		6		87		78		42	87	129

Notes:

1. National vehicle occupancy rates based on the 2009 National Household Travel Survey
2. ITE Trip Generation, 9th Edition, LUC 310 (Hotel). Average rate for p.m. peak and fitted curve for daily, Saturday, and peak Saturday.
3. Friday: No daily ITE rate available. Daily rate adopted from 959 Seward Street project, Hollywood, CA; Peak rate from ITE Trip Generation, 9th Edition, for LUC 925 (Drinking Place).
3. Saturday: No peak or daily ITE rate avaialble. Rates have been estimated based on proportion of daily and peak trips exhibited under LUC 931 (Quality Restaurant). See VAI calculation sheet (7/18/2013)
4. ITE Trip Generation, 9th Edition, LUC 820 (Shopping Center). Fitted curve for all time periods.
5. Gaming person trip generation developed from similar gaming facilities. See trip generation methodology documentation.
6. Proportion of work vs. non-work trips based on BTD Access Plan Guidelines (non-gaming) and Wynn (gaming)

REVISED 11/3/14

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
Janaury 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

FRIDAY DAILY

Component	Size	Category	Vehicle Trips per unit		Unadjusted Vehicle Trips	Notional vehicle occupancy rate	Person Trips	Proportion of work vs. non-work trips (see footnote 6): work	non-work	total	Employee person trips	Patron Person Trips
Hotel	629	Total	8.36	9.37	5,256		10,733				1,586	9,148
see footnote 2	rooms	In	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
		Out	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
Night Club/Lounge	0.0	Total	56.70		0		0				0	0
see footnote 3	KSF	In	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
Retail (shopping center)	66.556	Total	78.3		5,212		10,631				1,592	9,040
see footnote 4	KSF	In	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
		Out	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
Restaurant	0.00	Total	89.95		0		0				0	0
	KSF	In	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
Gaming	4,142	Total	9.06				37,512				3,074	34,438
see footnote 5	positions	In	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
		Out	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
FRIDAY DAILY Total		Total					58,877				6,252	52,625
		In					29,438	10.6%	89.4%	100.0%	3,126	26,312
		Out					29,438	10.6%	89.4%	100.0%	3,126	26,312

Patrons

100.0%

MODE SHARES

	Patron Public Transit ORANGE LINE	Patron Public Transit MBTA BUS	Patron Water Transportation	Patron Tour Bus: Share	AVO of Tour Bus	Patron Park and Ride Bus (LEX Model): Share	AVO of Tour Bus	Patron Auto: Share	Patron Taxi: Share
Casino Patrons:	10.0%	0.0%	6.0%	10.0%	47	3.0%	23	63.0%	8.0%
Non-Casino visitors:	10.0%	0.0%	6.0%	0.0%		0.0%		76.0%	8.0%

Component / Category	Patron Internal Trips: Percent	Person trips	Patron Pass-By: Percent	Person trips	Patron Person Trips: After internal and pass-by	Patron Public Transit ORANGE LINE: Share	Person trips	Patron Public Transit MBTA BUS: Share	Person trips	Patron Water Transportation: Share	Person trips	Patron Tour Bus: Share	Person trips	AVO of Tour Bus	Tour Buses
Hotel In	75%	3430	0%	0	1,143	10%	114	0%	0	6%	69	0%	0	47	0
Hotel Out	75%	3430	0%	0	1,143	10%	114	0%	0	6%	69	0%	0	47	0
Night Club/Lounge In	20%	0	10%	0	0	10%	0	0%	0	6%	0	0%	0	47	0
Night Club/Lounge Out	20%	0	10%	0	0	10%	0	0%	0	6%	0	0%	0	47	0
Retail (shopping center) In	20%	904	20%	904	2,712	10%	271	0%	0	6%	163	0%	0	47	0
Retail (shopping center) Out	20%	904	20%	904	2,712	10%	271	0%	0	6%	163	0%	0	47	0
Restaurant In	20%	0	10%	0	0	10%	0	10%	0	10%	0	10%	0	47	0
Restaurant Out	20%	0	10%	0	0	10%	0	10%	0	10%	0	10%	0	47	0
Gaming In	0%	0	0%	0	17,219	10%	1722	0%	0	6%	1033	10%	1,722	47	37
Gaming Out	0%	0	0%	0	17,219	10%	1722	0%	0	6%	1033	10%	1,722	47	37
FRIDAY DAILY Total Total		8669		1808	42,148		4,215		0		2,529		3,444		74
FRIDAY DAILY Total In		4334		904	21,074		2,107		0		1,264		1,722		37
FRIDAY DAILY Total Out		4334		904	21,074		2,107		0		1,264		1,722		37

Component / Category	Patron Park and Ride Bus (LEX Model): Share	Person trips	AVO of Tour Bus	Tour Buses	Patron Auto/Taxi – Patron Auto: Share	Person trips	AVO of autos	Autos	Patron Taxi: Share	Person trips	Patron AVO of taxis	Taxis	Total: Taxis + Autos
Hotel In	0%	0	23	0	76%	869	2.0	435	8%	91	2.0	46	481
Hotel Out	0%	0	23	0	76%	869	2.0	435	8%	91	2.0	46	481
Night Club/Lounge In	0%	0	23	0	76%	0	2.2	0	8%	0	2.0	0	0
Night Club/Lounge Out	0%	0	23	0	76%	0	2.2	0	8%	0	2.0	0	0
Retail (shopping center) In	0%	0	23	0	76%	2,061	2.2	937	8%	217	2.0	109	1,046
Retail (shopping center) Out	0%	0	23	0	76%	2,061	2.2	937	8%	217	2.0	109	1,046
Restaurant In	10%	0	47	0	10%	0	2.2	0	10%	0	2.0	0	0
Restaurant Out	10%	0	47	0	10%	0	2.2	0	10%	0	2.0	0	0
Gaming In	3%	517	23	23	63%	10,848	2.0	5,424	8%	1,378	2.0	689	6,113
Gaming Out	3%	517	23	23	63%	10,848	2.0	5,424	8%	1,378	2.0	689	6,113
FRIDAY DAILY Total Total		1,033		46		27,556		13,592		3,372		1,688	15,280
FRIDAY DAILY Total In		517		23		13,778		6,796		1,686		844	7,640
FRIDAY DAILY Total Out		517		23		13,778		6,796		1,686		844	7,640

FRIDAY PM PEAK

Component	Size	Category	Vehicle Trips per unit	Unadjusted Vehicle Trips	Notional vehicle occupancy rate	Person Trips	work	non-work	total	Employee person trips	Patron Person Trips
Hotel	629	Total	0.61	384		783				0	756
see footnote 2	rooms	In	0.35	223	2.0	454	0.0%	100.0%	100.0%	0	454
		Out	0.26	161	2.0	329	8.3%	91.7%	100.0%	0	302
Night Club/Lounge	0.0	Total	11.30	0		0				0	0
see footnote 3	KSF	In	7.68	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.62	0	2.1	0	5.6%	94.4%	100.0%	0	0
Retail (shopping center)	66.6	Total	6.85	456		930				0	677
see footnote 4	KSF	In	3.29	219	2.0	447	27.3%	72.7%	100.0%	0	325
		Out	3.56	237	2.0	484	27.3%	72.7%	100.0%	0	352
Restaurant	0.0	Total	9.02	0		0				0	0
	KSF	In	5.59	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.43	0	2.1	0	5.6%	94.4%	100.0%	0	0
Gaming	4,142	Total	0.66			2,728				0	2,728
see footnote 5	positions	In	0.33	686	2.0	1,372	0.0%	100.0%	100.0%	0	1,372
		Out	0.33	678	2.0	1,355	0.0%	100.0%	100.0%	0	1,355
FRIDAY PM PEAK Total		Total				4,441				0	4,160
		In				2,273	0.0%	100.0%	100.0%	0	2,151
		Out				2,168	0.0%	100.0%	100.0%	0	2,009

Component / Category	Patron Internal Trips: Percent	Person trips	Patron Pass-By: Percent	Person trips	Patron Person Trips: After internal and pass-by	ORANGE LINE: Share	Person trips	MBTA BUS: Share	Person trips	Water: Share	Person trips	Tour Bus: Share	Person trips	AVO of Tour Bus	Tour Buses
Hotel In	75%	341	0%	0	114	10%	11	0%	0	6%	7	0%	0	47	0
Hotel Out	75%	226	0%	0	75	10%	8	0%	0	6%	5	0%	0	47	0
Night Club/Lounge In	20%	0	10%	0	0	10%	0	0%	0	6%	0	0%	0	47	0
Night Club/Lounge Out	20%	0	10%	0	0	10%	0	0%	0	6%	0	0%	0	47	0
Retail (shopping center) In	20%	65	20%	65	195	10%	19	0%	0	6%	12	0%	0	47	0
Retail (shopping center) Out	20%	70	20%	70	211	10%	21	0%	0	6%	13	0%	0	47	0
Restaurant In	20%	0	10%	0	0	10%	0	10%	0	10%	0	10%	0	47	0
Restaurant Out	20%	0	10%	0	0	10%	0	10%	0	10%	0	10%	0	47	0
Gaming In	0%	0	0%	0	1,372	10%	137	0%	0	6%	82	10%	137	47	3
Gaming Out	0%	0	0%	0	1,355	10%	136	0%	0	6%	81	10%	136	47	3
FRIDAY PM PEAK Total Total		702		135	3,323		332		0		199		273		6
FRIDAY PM PEAK Total In		406		65	1,681		168		0		101		137		3
FRIDAY PM PEAK Total Out		297		70	1,642		164		0		99		136		3

Component / Category	Park and Ride Bus: Share	Person trips	AVO of Tour Bus	Tour Buses	Patron Auto: Share	Person trips	AVO of autos	Autos	Patron Taxi: Share	Person trips	Patron AVO of taxis	Taxis	Total: Taxis + Autos
Hotel In	0%	0	23	0	76%	86	2.0	44	8%	9	2.0	5	49
Hotel Out	0%	0	23	0	76%	57	2.0	29	8%	6	2.0	4	33
Night Club/Lounge In	0%	0	23	0	76%	0	2.2	0	8%	0	2.0	0	0
Night Club/Lounge Out	0%	0	23	0	76%	0	2.2	0	8%	0	2.0	0	0
Retail (shopping center) In	0%	0	23	0	76%	148	2.2	68	8%	16	2.0	8	76
Retail (shopping center) Out	0%	0	23	0	76%	160	2.2	73	8%	17	2.0	9	82
Restaurant In	10%	0	47	0	10%	0	2.2	0	10%	0	2.0	0	0
Restaurant Out	10%	0	47	0	10%	0	2.2	0	10%	0	2.0	0	0
Gaming In	3%	41	23	2	63%	864	2.0	433	8%	110	2.0	55	488
Gaming Out	3%	41	23	2	63%	854	2.0	427	8%	108	2.0	55	482
FRIDAY PM PEAK Total Total		82		4		2171		1074		266		136	1,210
FRIDAY PM PEAK Total In		41		2		1099		545		134		68	613
FRIDAY PM PEAK Total Out		41		2		1072		529		131		68	597

REVISED 11/3/14

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
Janaury 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

Component		Size	Category	Vehicle Trips per unit	Unadjusted Vehicle Trips	National vehicle occupancy rate	Person Trips	Proportion of work vs. non-work trips (see footnote 6) work	non-work	total	Employee person trips	Patron Person Trips
SATURDAY DAILY								work	non-work	total		
Hotel		629	Total	9 5	5756		11,754				1,736	10,018
see footnote 2		rooms	In	4 58	2876	2.0	5,877	15%	85 2%	100 0%	868	5,009
			Out	4 58	2878	2 0	5,877	15%	85 2%	100 0%	868	5,009
Night Club/Lounge		0 0	Total	142 85	0		0				0	0
see footnote 3		KSF	In	71 43	0	2 1	0	12 9%	87 1%	100.0%	0	0
			Out	71 43	0	2 1	0	12 9%	87 1%	100 0%	0	0
Retail (shopping center)		66 6	Total	107 42	7149		14,583				2,184	12,399
see footnote 4		KSF	In	53 71	3575	2 0	7,292	15 0%	85.0%	100 0%	1,092	6,200
			Out	53 71	3575	2 0	7,292	15 0%	85 0%	100 0%	1,092	6,200
Restaurant		0 0	Total	94 36	0		0				0	0
	0	KSF	In	47 18	0	2 1	0	12 9%	87 1%	100 0%	0	0
			Out	47 18	0	2	0	12 9%	87 1%	100.0%	0	0
Gaming		4 42	Total	10 55			43,707				3,582	40,125
see footnote 5		positions	In	5 28	10,927	2 0	21,854	8 2%	91 8%	100.0%	1,791	20,063
			Out	5 28	10,927	2 0	21,854	8 2%	91 8%	100 0%	1,791	20,063
SATURDAY DAILY Total			Total				70,045				7,502	62,543
			In				35,022	10.7%	89 3%	100.0%	3,751	31,271
			Out				35.022	10 7%	89 3%	100.0%	3,751	31,271
SATURDAY PEAK HOUR								work	non-work	total		
Hotel		629	Total	0 70	438		895				33	862
see footnote 2		rooms	In	0 39	245	2 0	501	0.0%	100.0%	100.0%	0	501
			Out	0 3	193	2 0	394	8.3%	91 7%	100.0%	33	361
Night Club/Lounge		0 0	Total	16 38	0		0				0	0
see footnote 3		KSF	In	9 66	0	2 1	0	14 5%	85.5%	100.0%	0	0
			Out	6 72	0	2 1	0	5.6%	94 4%	100.0%	0	0
Retail (shopping center)		66 6	Total	0 08	671		1,369				373	995
see footnote 4		KSF	In	5 24	349	2 0	712	27 3%	72.7%	100.0%	194	518
			Out	4 84	322	2 0	657	27 3%	72.7%	100.0%	179	478
Restaurant		0 0	Total	10 82	0		0				0	0
	0	KSF	In	6 38	0	2 1	0	14 5%	85.5%	100 0%	0	0
			Out	4 44	0	2 1	0	5.6%	94 4%	100.0%	0	0
Gaming		4 42	Total	0 79			3,255				14	3,117
see footnote 5		positions	In	0 38	789	2 0	1,578	0 9%	99 1%	100.0%	14	1,564
			Out	0 40	838	2 0	1,677	0.0%	100.0%	100.0%	0	1,554
SATURDAY PEAK HOUR Total			Total				5,519				420	4,975
			In				2,791	7 5%	92 5%	100.0%	208	2,583
			Out				2,728	8 1%	91.9%	100.0%	212	2,392

Patrons

Component	Category	Patron Internal Trips: Percent	Person trips	Patron Pass-By: Percent	Person trips	Patron Person Trips: After internal and pass-by	Patron Public Transit ORANGE LINE: Share	Person trips	Patron Public Transit MBTA BUS: Share	Person trips	Patron Water Transportation: Share	Person trips
SATURDAY DAILY												
Hotel	In	75%	3,757	0%	0	1,252	10%	125	0%	0	6%	75
	Out	75%	3,757	0%	0	1,252	10%	125	0%	0	6%	75
Night Club/Lounge	In	20%	0	10%	0	0	10%	0	0%	0	6%	0
	Out	20%	0	10%	0	0	10%	0	0%	0	6%	0
Retail (shopping center)	In	20%	1,240	20%	1240	3,720	10%	372	0%	0	6%	223
	Out	20%	1,240	20%	1240	3,720	10%	372	0%	0	6%	223
Restaurant	In	20%	0	10%	0	0	10%	0	10%	0	10%	0
	Out	20%	0	10%	0	0	10%	0	10%	0	10%	0
Gaming	In	0%	0	0%	0	20,063	10%	2,006	0%	0	6%	1,204
	Out	0%	0	0%	0	20,063	10%	2,006	0%	0	6%	1,204
SATURDAY DAILY Total	Total		9,993		2,480	50,070		5,007		0		3,004
	In		4,997		1,240	25,035		2,503		0		1,502
	Out		4,997		1,240	25,035		2,503		0		1,502
SATURDAY PEAK HOUR												
Hotel	In	75%	376	0%	0	125	10%	13	0%	0	6%	8
	Out	75%	271	0%	0	90	10%	9	0%	0	6%	5
Night Club/Lounge	In	20%	0	10%	0	0	10%	0	0%	0	6%	0
	Out	20%	0	10%	0	0	10%	0	0%	0	6%	0
Retail (shopping center)	In	20%	104	20%	104	311	10%	31	0%	0	6%	19
	Out	20%	96	20%	96	287	10%	29	0%	0	6%	17
Restaurant	In	20%	0	10%	0	0	10%	0	10%	0	10%	0
	Out	20%	0	10%	0	0	10%	0	10%	0	10%	0
Gaming	In	0%	0	0%	0	1,564	10%	156	0%	0	6%	94
	Out	0%	0	0%	0	1,554	10%	155	0%	0	6%	93
SATURDAY PEAK HOUR Total	Total		846		199	3,930		393		0		236
	In		479		104	2,000		200		0		120
	Out		366		96	1,931		193		0		116

100.0%

Component	Category	Patron Tour Bus: Share	Person trips	AVO of Tour Bus	Tour Buses	Patron Park and Ride Bus (LEX Model): Share	Person trips	AVO of Tour Bus	Tour Buses	Patron Auto/Taxi — Patron Auto: Share	Person trips	AVO of autos	Autos	Patron Taxi: Share	Person trips	Patron AVO of taxis	Taxis	Total: Taxis + Autos
SATURDAY DAILY																		
Hotel	In	0%	0	47	0	0%	0	23	0	76%	952	2 0	476	8%	100	2 0	51	527
	Out	0%	0	47	0	0%	0	23	0	76%	952	2.0	476	8%	100	2 0	51	527
Night Club/Lounge	In	0%	0	47	0	0%	0	23	0	76%	0	2 2	0	8%	0	2 0	0	0
	Out	0%	0	47	0	0%	0	23	0	76%	0	2.2	0	8%	0	2 0	0	0
Retail (shopping center)	In	0%	0	47	0	0%	0	23	0	76%	2,827	2 2	1,286	8%	298	2.0	149	1,435
	Out	0%	0	47	0	0%	0	23	0	76%	2,827	2 2	1,286	8%	298	2.0	149	1,435
Restaurant	In	10%	0	47	0	10%	0	47	0	10%	0	2 2	0	10%	0	2 0	0	0
	Out	10%	0	47	0	10%	0	47	0	10%	0	2 2	0	10%	0	2 0	0	0
Gaming	In	10%	2,006	47	43	3%	602	23	27	63%	12,640	2.0	6,320	8%	1,605	2 0	803	7,123
	Out	10%	2,006	47	43	3%	602	23	27	63%	12,640	2 0	6,320	8%	1,605	2.0	803	7,123
SATURDAY DAILY Total	Total		4,013		86		1,204		54		32,837		16,164		4,006		2,006	18,170
	In		2,006		43		602		27		16,418		8,082	2 8	2,003		1,003	9,085
	Out		2,006		43		602		27		16,418		8,082		2,003		1,003	9,085
SATURDAY PEAK HOUR																		
Hotel	In	0%	0	47	0	0%	0	23	0	76%	95	2 0	48	8%	10	2 0	6	54
	Out	0%	0	47	0	0%	0	23	0	76%	69	2.0	35	8%	7	2 0	4	39
Night Club/Lounge	In	0%	0	47	0	0%	0	23	0	76%	0	2 2	0	8%	0	2 0	0	0
	Out	0%	0	47	0	0%	0	23	0	76%	0	2 2	0	8%	0	2.0	0	0
Retail (shopping center)	In	0%	0	47	0	0%	0	23	0	76%	236	2 2	108	8%	25	2 0	13	121
	Out	0%	0	47	0	0%	0	23	0	76%	218	2.2	100	8%	23	2.0	12	112
Restaurant	In	10%	0	47	0	10%	0	47	0	10%	0	2.2	0	10%	0	2 0	0	0
	Out	10%	0	47	0	10%	0	47	0	10%	0	2 2	0	10%	0	2 0	0	0
Gaming	In	10%	156	47	4	3%	47	23	3	63%	985	2.0	493	8%	125	2.0	63	556
	Out	10%	155	47	4	3%	47	23	3	63%	979	2.0	490	8%	124	2.0	63	553
SATURDAY PEAK HOUR Total	Total		312		8		94		6		2,582		1,274		314		161	1,435
	In		156		4		47		3		1,317		649		160		82	731
	Out		155		4		47		3		1,265		625		154		79	704

Notes.

1 National vehicle occupancy rates based on the 2009 National Household Travel Survey

2 ITE Trip Generation, 9th Edition, LUC 310 (Hotel). Average rate for p.m. peak and fitted curve for daily, Saturday, and peak Saturday .

3 Friday: No daily ITE rate available. Daily rate adopted from 959 Seward Street project, Hollywood, CA; Peak rate from ITE Trip Generation, 9th Editio

3 Saturday: No peak or daily ITE rate avaialble. Rates have been estimated based on proportion of daily and peak trips exhibited under LUC 931 (Qualit

4 ITE Trip Generation, 9th Edition, LUC 820 (Shopping Center). Fitted curve for all time periods.

5 Gaming person trip generation developed from similar gaming facilities. See trip generation methodology documentation.

6 Proportion of work vs. non-work trips based on BTD Access Plan Guidelines (non-gaming) and Wynn (gaming)

REVISED 11/3/14

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
Janaury 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

Component	Size	Category	Vehicle Trips per unit		Unadjusted Vehicle Trips	National vehicle occupancy rate	Person Trips	Proportion of work vs non-work trips (see footnote 6) work	non-work	total	Employee person trips	Patron Person Trips
FRIDAY DAILY												
Hotel	629	Total	8.36	9.37	5,256		10,733				1,586	9,148
see footnote 2	rooms	In	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
		Out	4.18		2,628	2.04	5,367	14.8%	85.2%	100.0%	793	4,574
Night Club/Lounge	0.0	Total	56.70		0		0				0	0
see footnote 3	KSF	In	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	28.35		0	2.06	0	12.9%	87.1%	100.0%	0	0
Retail (shopping center)	66.556	Total	78.31		5,212		10,631				1,592	9,040
see footnote 4	KSF	In	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
		Out	39.16		2,606	2.04	5,316	15.0%	85.0%	100.0%	796	4,520
Restaurant	1.00	Total	89.95		0		0				0	0
	KSF	In	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
		Out	44.98		0	2.06	0	12.9%	87.1%	100.0%	0	0
Gaming	4,142	Total	9.06				37,512				3,074	34,438
see footnote 5	positions	In	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
		Out	4.53		9,378	2.00	18,756	8.2%	91.8%	100.0%	1,537	17,219
FRIDAY DAILY		Total					58,877				6,252	52,625
Total		In					29,438	10.6%	89.4%	100.0%	3,126	26,312
		Out					29,438	10.6%	89.4%	100.0%	3,126	26,312
FRIDAY PM PEAK												
Hotel	629	Total	0.61		384		783				0	756
see footnote 2	rooms	In	0.35		223	2.0	454	0.0%	100.0%	100.0%	0	454
		Out	0.26		161	2.0	329	8.3%	91.7%	100.0%	0	302
Night Club/Lounge	0.0	Total	11.30		0		0				0	0
see footnote 3	KSF	In	7.68		0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.62		0	2.1	0	5.6%	94.4%	100.0%	0	0
Retail (shopping center)	66.6	Total	6.85		456		930				0	677
see footnote 4	KSF	In	3.29		219	2.0	447	27.3%	72.7%	100.0%	0	325
		Out	3.56		237	2.0	484	27.3%	72.7%	100.0%	0	352
Restaurant	0.0	Total	9.02		0		0				0	0
0	KSF	In	5.59		0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	3.43		0	2.1	0	5.6%	94.4%	100.0%	0	0
Gaming	4,142	Total	0.66				2,728				0	2,728
see footnote 5	positions	In	0.33		686	2.0	1,372	0.0%	100.0%	100.0%	0	1,372
		Out	0.33		678	2.0	1,355	0.0%	100.0%	100.0%	0	1,355
FRIDAY PM PEAK		Total					4,441				0	4,160
Total		In					2,273	0.0%	100.0%	100.0%	0	2,151
		Out					2,168	0.0%	100.0%	100.0%	0	2,009

Trip Generation Summary

Component	Category	All Persons	Public Transit: Orange Line Passengers Trips	Public Transit: MBTA Bus Passenger Trips	Public Transit: Water Transportation Passenger Trips	Employee Shuttle: Passenger Trips (From parking lots and neighbor-hoods along routes)	Employee Shuttle: Shuttle Bus Trips (Based on average headway of 30 minutes throughout the day to each of 3 parking facilities)	Transit Shuttle to Orange Line Stations at Sullivan and Wellington: Passenger Trips (Employees and Patrons arriving at Orange Line)	Transit Shuttle to Orange Line Stations at Sullivan and Wellington: Shuttle Bus Trips (Based on average headway of 20 minutes for 20 hours day to 2 stations)	Tour Buses: Passenger Trips	Tour Buses: Bus Trips	PPR Buses: Passenger Trips	PPR Buses: Bus Trips	Employee Autos: Auto trips (Park remotely)	Patron Auto/Taxi: Patron auto trips (Park on-site)	Patron Auto/Taxi: Patron taxi trips	Patron Auto/Taxi: Patron Auto + Taxi trips
FRIDAY DAILY																	
Hotel	In	1,936	273	79	92	484		273		0	0	0	0	288	435	46	481
	Out	1,936	273	79	92	484		273		0	0	0	0	288	435	46	481
Night Club/Lounge	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Retail (shopping center)	In	3,508	430	80	187	486		430		0	0	0	0	289	937	109	1046
	Out	3,508	430	80	187	486		430		0	0	0	0	289	937	109	1046
Restaurant	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Gaming	In	18,756	2,029	154	1,079	938		2,029		1722	37	517	23	558	5424	689	6113
	Out	18,756	2,029	154	1,079	938		2,029		1722	37	517	23	558	5424	689	6113
FRIDAY DAILY Total	Total	48,400	5,465	625	2,716	3,814	288	5,465	240	3,444	74	1,033	46	2,270	13,592	1,688	15,280
	In	24,200	2,733	313	1,358	1,907	144	2,733	120	1,722	37	517	23	1,135	6,796	844	7,640
	Out	24,200	2,733	313	1,358	1,907	144	2,733	120	1,722	37	517	23	1,135	6,796	844	7,640
FRIDAY PM PEAK																	
Hotel	In	114	11	0	7	0		11		0	0	0	0	0	44	5	49
	Out	75	8	0	5	0		8		0	0	0	0	0	29	4	33
Night Club/Lounge	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Retail (shopping center)	In	195	19	0	12	0		19		0	0	0	0	0	68	8	76
	Out	211	21	0	13	0		21		0	0	0	0	0	73	9	82
Restaurant	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Gaming	In	1,372	137	0	82	0		137		137	3	41	2	0	433	55	488
	Out	1,355	136	0	81	0		136		136	3	41	2	0	427	55	482
FRIDAY PM PEAK Total	Total	3,323	332	0	199	0	12	332	12	273	6	82	4	0	1,074	136	1,210
	In	1,681	168	0	101	0	6	168	6	137	3	41	2	0	545	68	613
	Out	1,642	164	0	99	0	6	164	6	136	3	41	2	0	529	68	597

REVISED 11/3/14

Wynn Everett - Trip Generation

Howard/Stein-Hudson Associates
Janaury 22, 2015
ALTERNATIVE 5 - 1/9/2015 program

Component	Size	Category	Vehicle Trips per unit	Unadjusted Vehicle Trips	National vehicle occupancy rate	Person Trips	Proportion of work vs. non-work trips (see footnote 6): work	non-work	total	Employee person trips	Patron Person Trips
SATURDAY DAILY											
Hotel	629	Total	9.[illegible]5	5756		11,754				1,736	10,018
see footnote 2	rooms	In	4.58	2878	2.0	5,877	15%	85.2%	100.0%	868	5,009
		Out	4.58	2878	2.0	5,877	15%	85.2%	100.0%	868	5,009
Night Club/Lounge	0.0	Total	142.85	0		0				0	0
see footnote 3	KSF	In	71.43	0	2.1	0	12.9%	87.1%	100.0%	0	0
		Out	71.43	0	2.1	0	12.9%	87.1%	100.0%	0	0
Retail (shopping center)	66.6	Total	107.42	7149		14,583				2,184	12,399
see footnote 4	KSF	In	53.71	3575	2.0	7,292	15.0%	85.0%	100.0%	1,092	6,200
		Out	53.71	3575	2.0	7,292	15.0%	85.0%	100.0%	1,092	6,200
Restaurant	0.0	Total	94.36	0		0				0	0
0	KSF	In	47.18	0	2.1	0	12.9%	87.1%	100.0%	0	0
		Out	47.18	0	2.1	0	12.9%	87.1%	100.0%	0	0
Gaming	4,142	Total	10.55			43,707				3,582	40,125
see footnote 5	positions	In	5.28	10,927	2.0	21,854	8.2%	91.8%	100.0%	1,791	20,063
		Out	5.28	10,927	2.0	21,854	8.2%	91.8%	100.0%	1,791	20,063
SATURDAY DAILY Total		Total				70,045				7,502	62,543
		In				35,022	10.7%	89.3%	100.0%	3,751	31,271
		Out				35,022	10.7%	89.3%	100.0%	3,751	31,271
SATURDAY PEAK HOUR							work	non-work	total		
Hotel	629	Total	0.70	438		895				33	862
see footnote 2	rooms	In	0.39	245	2.0	501	0.0%	100.0%	100.0%	0	501
		Out	0.31	193	2.0	394	8.3%	91.7%	100.0%	33	361
Night Club/Lounge	0.0	Total	16.38	0		0				0	0
see footnote 3	KSF	In	9.66	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	6.72	0	2.1	0	5.6%	94.4%	100.0%	0	0
Retail (shopping center)	66.6	Total	10.08	671		1,369				373	995
see footnote 4	KSF	In	5.24	349	2.0	712	27.3%	72.7%	100.0%	194	518
		Out	4.84	322	2.0	657	27.3%	72.7%	100.0%	179	478
Restaurant	0.0	Total	0.82	0		0				0	0
0	KSF	In	6.38	0	2.1	0	14.5%	85.5%	100.0%	0	0
		Out	4.44	0	2.1	0	5.6%	94.4%	100.0%	0	0
Gaming	4,142	Total	0.79			3,255				14	3,117
see footnote 5	positions	In	0.38	789	2.0	1,578	0.9%	99.1%	100.0%	14	1,564
		Out	0.40	838	2.0	1,677	0.0%	100.0%	100.0%	0	1,554
SATURDAY PEAK HOUR Total		Total				5,519				420	4,975
		In				2,791	7.5%	92.5%	100.0%	208	2,583
		Out				2,728	8.1%	91.9%	100.0%	212	2,392

Trip Generation Summary

Component	Category	All Persons	Public Transit: Orange Line Passengers Trips	Public Transit: MBTA Bus Passenger Trips	Public Transit: Water Transportation Passenger Trips	Employee Shuttle: Passenger Trips (From parking lots and neighbor-hoods along routes)	Employee Shuttle: Shuttle Bus Trips (Based on average headway of 30 minutes throughout the day to each of 3 parking facilities)	Transit Shuttle to Orange Line Stations at Sullivan and Wellington: Passenger Trips (Employees and Patrons arriving at Orange Line)	Transit Shuttle: Shuttle Bus Trips (Based on average headway of 20 minutes for 20 hours day to 2 stations)	Tour Buses: Passenger Trips	Tour Buses: Bus Trips	PPR Buses: Passenger Trips	PPR Buses: Bus Trips	Employee Autos: Auto trips (Park remotely)	Patron Auto/Taxi: Patron auto trips (Park on-site)	Patron taxi trips	Patron Auto + Taxi trips
SATURDAY DAILY																	
Hotel	In	2,120	299	87	101	530		299		0	0	0	0	316	476	51	527
	Out	2,120	299	87	101	530		299		0	0	0	0	316	476	51	527
Night Club/Lounge	In	0	0	0	0	0		0		0	0	0	0	0	0	0	[illegible]
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Retail (shopping center)	In	4,812	590	109	256	666		590		0	0	0	0	397	1286	149	1435
	Out	4,812	590	109	256	666		590		0	0	0	0	397	1286	149	1435
Restaurant	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Gaming	In	21,854	2,364	179	1,257	1,093		2,364		2,006	43	602	27	650	6320	803	7123
	Out	21,854	2,364	179	1,257	1,093		2,364		2,006	43	602	27	650	6320	803	7123
SATURDAY DAILY Total	Total	57,571	6,507	750	3,229	4,576	288	6,507	240	4,013	86	1,204	54	2,726	16,164	2,006	18,170
	In	28,786	3,254	375	1,615	2,288	144	3,254	120	2,006	43	602	27	1,363	8,082	1,003	9,085
	Out	28,786	3,254	375	1,615	2,288	144	3,254	120	2,006	43	602	27	1,363	8,082	1,003	9,085
SATURDAY PEAK HOUR																	
Hotel	In	125	13	0	8	0		13		0	0	0	0	0	48	6	54
	Out	123	16	3	6	20		16		0	0	0	0	12	35	4	39
Night Club/Lounge	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Retail (shopping center)	In	505	70	19	24	118		70		0	0	0	0	71	108	13	121
	Out	466	65	18	23	109		65		0	0	0	0	66	100	12	112
Restaurant	In	0	0	0	0	0		0		0	0	0	0	0	0	0	0
	Out	0	0	0	0	0		0		0	0	0	0	0	0	0	0
Gaming	In	1,578	159	1	94	9		159		156	4	47	3	6	493	63	556
	Out	1,554	155	0	93	0		155		155	4	47	3	0	490	63	553
SATURDAY PEAK HOUR Total	Total	4,351	477	42	248	256	12	477	12	312	8	94	6	155	1,274	161	1,435
	In	2,208	242	21	126	127	6	242	6	156	4	47	3	77	649	82	731
	Out	2,142	235	21	122	129	6	235	6	155	4	47	3	78	625	79	704

Notes

1. National vehicle occupancy rates based on the 2009 National Household Travel Survey
2. ITE Trip Generation, 9th Edition, LUC 310 (Hotel). Average rate for p.m. peak and fitted curve for daily, Saturday, and peak Saturday.
3. Friday. No daily ITE rate available. Daily rate adopted from 959 Seward Street project, Hollywood, CA; Peak rate from ITE Trip Generation, 9th Editio
3. Saturday. No peak or daily ITE rate available. Rates have been estimated based on proportion of daily and peak trips exhibited under LUC 931 (Qualit
4. ITE Trip Generation, 9th Edition, LUC 820 (Shopping Center). Fitted curve for all time periods.
5. Gaming person trip generation developed from similar gaming facilities. See trip generation methodology documentation.
6. Proportion of work vs. non-work trips based on BTD Access Plan Guidelines (non-gaming) and Wynn (gaming)

Truck Trip Generation

Wynn Everett
Truck Trip Generation
1/28/2015

Wynn Everett Program		
686,578	square feet	Hotel (629 rooms)
0	square feet	Night Club
79,455	square feet	Retail
237,001	square feet	Gaming (4,580 positions)

Separate land uses

	Size	Light Trucks		Medium/Heavy Trucks		Total Daily Generator Trips (arrivals)
Major Generator	(KSF)	Proposed Rate[1]	Daily Trips	Proposed Rate[1]	Daily Trips	
Storefront Retail	79	0.15	12	0.02	2	14
Restaurant/club	0	0.7	0	0.07	0	0
Hotel	687	0.03	21	0.01	7	28
Gaming	237		0		0	0
Total Daily Deliveres			33		9	42

Source:

1 Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area, Tom Nixon, September 1993.

Trips shown are arrivals only.

Combine uses for "casino" with separate retail

	Size	Light Trucks		Medium/Heavy Trucks		Total Daily Generator Trips (arrivals)
Major Generator	(KSF)	Proposed Rate	Daily Trips	Proposed Rate	Daily Trips	
Storefront Retail[1]	79	0.15	12	0.02	2	14
Hotel Casino[2]	237					43
Total Daily Deliveries						57

Source:

1 Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area, Tom Nixon, September 1993.

2 Las Vegas Region Freight Data Collection Study, Table 5-1, CH2mHill, August 7, 2013

Trips shown are arrivals only.

B.2 Lower Broadway/Alford Street (Route 99), Everett/Boston

a. Synchro Output
   a. Existing (2014) Conditions
   b. No Build (2023) Conditions
   c. Build (2023) Conditions
   d. Build (2023) Mitigated Conditions
b. VISSIM Output

Synchro Output

Existing (2014) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	2	46	257	16	41	34	1237	7	63	984	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	14	16	16	11	16	16
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			1.00	
Flt Protected		0.96	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1815	1615		1687			4004			3972	
Flt Permitted		0.79	1.00		0.73			0.87			0.60	
Satd. Flow (perm)		1495	1615		1283			3500			2386	
Peak-hour factor, PHF	0.72	0.72	0.72	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	3	64	268	17	43	37	1345	8	68	1070	37
RTOR Reduction (vph)	0	0	51	0	6	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	50	13	0	322	0	0	1389	0	0	1173	0
Heavy Vehicles (%)	0%	0%	0%	4%	0%	23%	0%	2%	4%	7%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.0	20.0		20.0			31.0			61.8	
Effective Green, g (s)		20.0	20.0		20.0			31.0			61.8	
Actuated g/C Ratio		0.20	0.20		0.20			0.31			0.62	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		299	323		256			1085			1883	
v/s Ratio Prot											c0.16	
v/s Ratio Perm		0.03	0.01		c0.25			c0.40			0.22	
v/c Ratio		0.17	0.04		1.26			1.28			0.62	
Uniform Delay, d1		33.1	32.3		40.0			34.5			11.9	
Progression Factor		1.00	1.00		1.00			1.00			1.34	
Incremental Delay, d2		0.3	0.1		144.3			133.4			0.6	
Delay (s)		33.4	32.3		184.3			167.9			16.5	
Level of Service		C	C		F			F			B	
Approach Delay (s)		32.8			184.3			167.9			16.5	
Approach LOS		C			F			F			B	

Intersection Summary			
HCM 2000 Control Delay	105.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	22	15	14	1298	1066	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.94			1.00	1.00	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1802			3573	3566	
Flt Permitted	0.97			0.94	1.00	
Satd. Flow (perm)	1802			3342	3566	
Peak-hour factor, PHF	0.84	0.84	0.94	0.94	0.89	0.89
Adj. Flow (vph)	26	18	15	1381	1198	12
RTOR Reduction (vph)	17	0	0	0	0	0
Lane Group Flow (vph)	27	0	0	1396	1210	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	4.8			77.0	77.0	
Effective Green, g (s)	4.8			77.0	77.0	
Actuated g/C Ratio	0.05			0.77	0.77	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	86			2573	2745	
v/s Ratio Prot	c0.01				0.34	
v/s Ratio Perm				c0.42		
v/c Ratio	0.31			0.54	0.44	
Uniform Delay, d1	46.0			4.5	4.0	
Progression Factor	1.00			0.98	1.00	
Incremental Delay, d2	2.1			0.1	0.5	
Delay (s)	48.1			4.5	4.5	
Level of Service	D			A	A	
Approach Delay (s)	48.1			4.5	4.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	234	0	13	0	1487	74	8	1282	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	12	12	16	15	15	16
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2004			3478			3892	
Flt Permitted					0.95			1.00			0.94	
Satd. Flow (perm)					2004			3478			3672	
Peak-hour factor, PHF	0.25	0.25	0.25	0.85	0.85	0.85	0.98	0.98	0.98	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	275	0	15	0	1517	76	8	1335	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	268	0	0	1589	0	0	1343	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA			NA		Perm	NA	
Protected Phases					3			1			1	
Permitted Phases				3			1			1		
Actuated Green, G (s)					15.5			54.5			54.5	
Effective Green, g (s)					15.5			54.5			54.5	
Actuated g/C Ratio					0.19			0.68			0.68	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					388			2369			2501	
v/s Ratio Prot								c0.46				
v/s Ratio Perm					0.13						0.37	
v/c Ratio					0.69			0.67			0.54	
Uniform Delay, d1					30.0			7.5			6.4	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					5.2			1.5			0.8	
Delay (s)					35.3			9.0			7.2	
Level of Service					D			A			A	
Approach Delay (s)		0.0			35.3			9.0			7.2	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	18	3	1497	1272	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.63	0.63	0.92	0.92	0.99	0.99
Hourly flow rate (vph)	10	29	3	1627	1285	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				314		
pX, platoon unblocked	0.72					
vC, conflicting volume	2105	643	1286			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1757	643	1286			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	93	99			
cM capacity (veh/h)	56	409	546			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	546	1085	857	429
Volume Left	10	3	0	0	0
Volume Right	29	0	0	0	1
cSH	158	546	1700	1700	1700
Volume to Capacity	0.24	0.01	0.64	0.50	0.25
Queue Length 95th (ft)	22	0	0	0	0
Control Delay (s)	34.9	0.2	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	34.9	0.1		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Route 99 & Horizon Way

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	101	181	135	6	39
Average Queue (ft)	27	83	79	0	2
95th Queue (ft)	80	280	275	4	16
Link Distance (ft)	154	259	259	460	460
Upstream Blk Time (%)	3	5	5		
Queuing Penalty (veh)	0	36	35		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Bow Street & Mystic Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	354	347	92	75
Average Queue (ft)	194	195	7	2
95th Queue (ft)	545	547	43	32
Link Distance (ft)	460	460	307	307
Upstream Blk Time (%)	9	10		
Queuing Penalty (veh)	69	74		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Bow Street & Lynde Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	34
Average Queue (ft)	6
95th Queue (ft)	26
Link Distance (ft)	37
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	335	342	132	116
Average Queue (ft)	190	191	21	9
95th Queue (ft)	425	428	83	61
Link Distance (ft)	307	307	510	510
Upstream Blk Time (%)	21	22		
Queuing Penalty (veh)	137	142		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bow Street & Thorndike Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	45
Average Queue (ft)	22
95th Queue (ft)	46
Link Distance (ft)	84
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	50	50	408	539	535	404	379
Average Queue (ft)	24	23	225	476	481	203	170
95th Queue (ft)	53	48	383	620	614	346	313
Link Distance (ft)	36	36	718	510	510	716	716
Upstream Blk Time (%)	6	3		30	31		
Queuing Penalty (veh)	0	0		192	197		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	72	83	90	214	174
Average Queue (ft)	29	18	22	66	33
95th Queue (ft)	65	59	68	179	113
Link Distance (ft)	102	716	716	201	201
Upstream Blk Time (%)	0			1	0
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Robin Street & Beacham Street/Beaham Street

Movement	WB	NB	SB	SB
Directions Served	LTR	LTR	LT	R
Maximum Queue (ft)	122	117	48	59
Average Queue (ft)	39	54	3	5
95th Queue (ft)	93	95	20	31
Link Distance (ft)	230	634	153	153
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	150	444	424	234	263
Average Queue (ft)	112	254	228	119	133
95th Queue (ft)	158	611	589	209	233
Link Distance (ft)	117	728	728	259	259
Upstream Blk Time (%)	14	7	7	0	0
Queuing Penalty (veh)	0	0	0	0	1
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 884

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	9	53	237	15	33	34	966	11	32	1170	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	14	16	16	11	16	16
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			0.99	
Flt Protected		0.97	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1835	1615		1680			4039			4061	
Flt Permitted		0.84	1.00		0.74			0.84			0.79	
Satd. Flow (perm)		1589	1615		1287			3417			3204	
Peak-hour factor, PHF	0.84	0.84	0.84	0.94	0.94	0.94	0.89	0.89	0.89	0.97	0.97	0.97
Adj. Flow (vph)	27	11	63	252	16	35	38	1085	12	33	1206	47
RTOR Reduction (vph)	0	0	50	0	5	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	38	13	0	298	0	0	1134	0	0	1284	0
Heavy Vehicles (%)	0%	0%	0%	7%	0%	9%	0%	1%	0%	0%	0%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.0	20.0		20.0			32.0			61.8	
Effective Green, g (s)		20.0	20.0		20.0			32.0			61.8	
Actuated g/C Ratio		0.20	0.20		0.20			0.32			0.62	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		317	323		257			1093			2192	
v/s Ratio Prot											c0.15	
v/s Ratio Perm		0.02	0.01		c0.23			c0.33			0.22	
v/c Ratio		0.12	0.04		1.16			1.04			0.59	
Uniform Delay, d1		32.8	32.3		40.0			34.0			11.4	
Progression Factor		1.00	1.00		1.00			1.00			1.26	
Incremental Delay, d2		0.2	0.0		106.5			37.5			0.4	
Delay (s)		33.0	32.3		146.5			71.5			14.8	
Level of Service		C	C		F			E			B	
Approach Delay (s)		32.5			146.5			71.5			14.8	
Approach LOS		C			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	17	21	16	1006	1227	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.93			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1777			3572	3568	
Flt Permitted	0.98			0.92	1.00	
Satd. Flow (perm)	1777			3294	3568	
Peak-hour factor, PHF	0.77	0.77	0.91	0.91	0.99	0.99
Adj. Flow (vph)	22	27	18	1105	1239	16
RTOR Reduction (vph)	25	0	0	0	0	0
Lane Group Flow (vph)	24	0	0	1123	1255	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4			75.4	75.4	
Effective Green, g (s)	6.4			75.4	75.4	
Actuated g/C Ratio	0.06			0.75	0.75	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	113			2483	2690	
v/s Ratio Prot	c0.01				c0.35	
v/s Ratio Perm				0.34		
v/c Ratio	0.21			0.45	0.47	
Uniform Delay, d1	44.4			4.6	4.7	
Progression Factor	1.00			0.42	1.00	
Incremental Delay, d2	0.9			0.2	0.6	
Delay (s)	45.3			2.1	5.3	
Level of Service	D			A	A	
Approach Delay (s)	45.3			2.1	5.3	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	152	0	5	0	1078	37	3	1439	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	12	12	16	15	15	16
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					1.00			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2026			3567			3931	
Flt Permitted					0.95			1.00			0.95	
Satd. Flow (perm)					2026			3567			3748	
Peak-hour factor, PHF	0.25	0.25	0.25	0.92	0.92	0.92	0.89	0.89	0.89	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	165	0	5	0	1211	42	3	1484	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	147	0	0	1251	0	0	1487	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	21%	0%	1%	0%
Turn Type				Perm	NA			NA		Perm	NA	
Protected Phases					3			1			1	
Permitted Phases				3			1			1		
Actuated Green, G (s)					11.3			58.7			58.7	
Effective Green, g (s)					11.3			58.7			58.7	
Actuated g/C Ratio					0.14			0.73			0.73	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					286			2617			2750	
v/s Ratio Prot								0.35				
v/s Ratio Perm					0.07						c0.40	
v/c Ratio					0.51			0.48			0.54	
Uniform Delay, d1					31.8			4.4			4.7	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.6			0.6			0.8	
Delay (s)					33.4			5.0			5.5	
Level of Service					C			A			A	
Approach Delay (s)		0.0			33.4			5.0			5.5	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	14	1	1082	1428	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.86	0.89	0.99	0.99
Hourly flow rate (vph)	1	19	1	1216	1442	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				314		
pX, platoon unblocked	0.85					
vC, conflicting volume	2054	723	1445			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1889	723	1445			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	95	100			
cM capacity (veh/h)	54	373	475			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	406	810	962	484
Volume Left	1	1	0	0	0
Volume Right	19	0	0	0	3
cSH	268	475	1700	1700	1700
Volume to Capacity	0.07	0.00	0.48	0.57	0.28
Queue Length 95th (ft)	6	0	0	0	0
Control Delay (s)	19.5	0.1	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	19.5	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Route 99 & Horizon Way

Movement	EB	NB	SB	SB
Directions Served	LR	LT	T	TR
Maximum Queue (ft)	42	14	14	24
Average Queue (ft)	12	1	0	1
95th Queue (ft)	36	11	10	17
Link Distance (ft)	154	259	460	460
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Bow Street & Mystic Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	SB	SB
Directions Served	LT	T
Maximum Queue (ft)	72	14
Average Queue (ft)	8	1
95th Queue (ft)	38	13
Link Distance (ft)	307	307
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Bow Street & Lynde Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	47
Average Queue (ft)	10
95th Queue (ft)	36
Link Distance (ft)	37
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	116	128	83	61
Average Queue (ft)	15	17	9	4
95th Queue (ft)	89	94	53	45
Link Distance (ft)	307	307	510	510
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bow Street & Thorndike Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	39
Average Queue (ft)	12
95th Queue (ft)	38
Link Distance (ft)	84
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	50	50	372	503	521	380	352
Average Queue (ft)	21	26	214	291	306	180	160
95th Queue (ft)	51	50	342	498	509	297	278
Link Distance (ft)	36	36	718	510	510	716	716
Upstream Blk Time (%)	6	3		3	4		
Queuing Penalty (veh)	0	0		17	18		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	91	130	123	216	219
Average Queue (ft)	31	25	20	73	47
95th Queue (ft)	69	86	78	204	156
Link Distance (ft)	102	716	716	201	201
Upstream Blk Time (%)	0			2	1
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Robin Street & Beacham Street/Beaham Street

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	1	77	74	46	62
Average Queue (ft)	0	25	29	3	7
95th Queue (ft)	1	63	60	21	37
Link Distance (ft)	718	230	634	153	153
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	132	154	120	212	229
Average Queue (ft)	90	77	53	95	108
95th Queue (ft)	138	134	108	187	198
Link Distance (ft)	117	728	728	259	259
Upstream Blk Time (%)	6			0	0
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 35

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2	48	267	17	43	36	1486	7	66	1208	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			1.00	
Flt Protected		0.95	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1814	1615		1699			3447			3426	
Flt Permitted		0.80	1.00		0.74			0.85			0.60	
Satd. Flow (perm)		1519	1615		1304			2939			2076	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	2	52	278	18	45	39	1615	8	72	1313	39
RTOR Reduction (vph)	0	0	42	0	6	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	41	10	0	335	0	0	1662	0	0	1422	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	5%	0%	1%	14%	5%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.0	20.0		20.0			26.8			61.8	
Effective Green, g (s)		20.0	20.0		20.0			26.8			61.8	
Actuated g/C Ratio		0.20	0.20		0.20			0.27			0.62	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		303	323		260			787			1687	
v/s Ratio Prot											c0.25	
v/s Ratio Perm		0.03	0.01		c0.26			c0.57			0.27	
v/c Ratio		0.14	0.03		1.29			2.11			0.84	
Uniform Delay, d1		32.9	32.2		40.0			36.6			15.2	
Progression Factor		1.00	1.00		1.00			1.00			1.26	
Incremental Delay, d2		0.2	0.0		156.2			504.6			3.6	
Delay (s)		33.1	32.2		196.2			541.2			22.7	
Level of Service		C	C		F			F			C	
Approach Delay (s)		32.6			196.2			541.2			22.7	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	284.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	116.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	45	50	77	1487	1261	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1782			3532	3541	
Flt Permitted	0.98			0.73	1.00	
Satd. Flow (perm)	1782			2594	3541	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.92	0.92
Adj. Flow (vph)	49	54	82	1582	1371	58
RTOR Reduction (vph)	40	0	0	0	2	0
Lane Group Flow (vph)	63	0	0	1664	1427	0
Heavy Vehicles (%)	0%	0%	1%	2%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4			75.4	75.4	
Effective Green, g (s)	6.4			75.4	75.4	
Actuated g/C Ratio	0.06			0.75	0.75	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	114			1955	2669	
v/s Ratio Prot	c0.04				0.40	
v/s Ratio Perm				c0.64		
v/c Ratio	0.55			0.85	0.53	
Uniform Delay, d1	45.4			8.4	5.1	
Progression Factor	1.00			3.00	1.00	
Incremental Delay, d2	5.6			0.5	0.8	
Delay (s)	51.0			25.8	5.8	
Level of Service	D			C	A	
Approach Delay (s)	51.0			25.8	5.8	
Approach LOS	D			C	A	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	0	14	0	1746	77	8	1533	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	12	12	12	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2003			3485			3421	
Flt Permitted					0.95			1.00			0.94	
Satd. Flow (perm)					2003			3485			3219	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	266	0	15	0	1819	80	8	1564	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	259	0	0	1896	0	0	1572	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA			NA		Perm	NA	
Protected Phases					3			1			1	
Permitted Phases				3			1			1		
Actuated Green, G (s)					15.2			54.8			54.8	
Effective Green, g (s)					15.2			54.8			54.8	
Actuated g/C Ratio					0.19			0.68			0.68	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					380			2387			2205	
v/s Ratio Prot								c0.54				
v/s Ratio Perm					0.13						0.49	
v/c Ratio					0.68			0.79			0.71	
Uniform Delay, d1					30.2			8.7			7.8	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					5.0			2.8			2.0	
Delay (s)					35.1			11.5			9.8	
Level of Service					D			B			A	
Approach Delay (s)		0.0			35.1			11.5			9.8	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

No Build (2023) Conditions

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	19	3	1758	1509	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.99	0.99
Hourly flow rate (vph)	7	21	3	1911	1524	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				314		
pX, platoon unblocked	0.59					
vC, conflicting volume	2487	763	1525			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2127	763	1525			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	94	99			
cM capacity (veh/h)	26	341	443			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	27	640	1274	1016	509
Volume Left	7	3	0	0	0
Volume Right	21	0	0	0	1
cSH	86	443	1700	1700	1700
Volume to Capacity	0.32	0.01	0.75	0.60	0.30
Queue Length 95th (ft)	30	1	0	0	0
Control Delay (s)	65.0	0.2	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	65.0	0.1		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection: 1: Route 99 & Horizon Way

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	157	290	298	162	200
Average Queue (ft)	93	268	270	11	14
95th Queue (ft)	194	300	306	80	96
Link Distance (ft)	162	259	259	460	460
Upstream Blk Time (%)	34	24	27		0
Queuing Penalty (veh)	0	212	235		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Bow Street & Mystic Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	496	501	48	34
Average Queue (ft)	470	471	4	1
95th Queue (ft)	484	489	26	15
Link Distance (ft)	460	460	307	307
Upstream Blk Time (%)	38	40		
Queuing Penalty (veh)	335	356		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Bow Street & Lynde Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	33
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	37
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	337	346	133	120
Average Queue (ft)	317	318	19	9
95th Queue (ft)	329	334	77	59
Link Distance (ft)	307	307	510	510
Upstream Blk Time (%)	49	51		
Queuing Penalty (veh)	379	390		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bow Street & Thorndike Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	40
Average Queue (ft)	22
95th Queue (ft)	46
Link Distance (ft)	88
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	55	55	480	550	540	361	332
Average Queue (ft)	25	27	245	521	523	223	200
95th Queue (ft)	57	55	404	534	533	341	316
Link Distance (ft)	40	40	728	510	510	715	715
Upstream Blk Time (%)	7	4		51	51		
Queuing Penalty (veh)	0	0		389	393		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	128	190	210	216	208
Average Queue (ft)	62	66	52	97	61
95th Queue (ft)	117	146	146	219	170
Link Distance (ft)	113	715	715	201	201
Upstream Blk Time (%)	2			2	1
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Robin Street & Beacham Street/Beaham Street

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	2	156	119	31	44
Average Queue (ft)	0	51	53	1	3
95th Queue (ft)	1	114	94	12	23
Link Distance (ft)	728	230	634	153	153
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	146	784	787	264	281
Average Queue (ft)	118	738	737	155	166
95th Queue (ft)	165	868	872	267	277
Link Distance (ft)	124	728	728	259	259
Upstream Blk Time (%)	14	78	81	1	1
Queuing Penalty (veh)	0	0	0	6	8
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 2702

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	9	56	248	16	35	37	1129	12	34	1320	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			0.99	
Flt Protected		0.97	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1834	1615		1680			3446			3465	
Flt Permitted		0.80	1.00		0.74			0.84			0.73	
Satd. Flow (perm)		1519	1615		1292			2898			2529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	25	10	61	264	17	37	40	1227	13	35	1361	49
RTOR Reduction (vph)	0	0	46	0	5	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	35	15	0	313	0	0	1279	0	0	1443	0
Heavy Vehicles (%)	0%	0%	0%	7%	0%	9%	0%	1%	0%	0%	0%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.3	20.3		20.3			30.5			45.6	
Effective Green, g (s)		20.3	20.3		20.3			30.5			45.6	
Actuated g/C Ratio		0.24	0.24		0.24			0.37			0.55	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		370	393		314			1061			1497	
v/s Ratio Prot											c0.12	
v/s Ratio Perm		0.02	0.01		c0.24			c0.44			0.41	
v/c Ratio		0.09	0.04		1.00			1.21			0.96	
Uniform Delay, d1		24.4	24.0		31.5			26.4			18.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.1	0.0		50.0			101.7			15.4	
Delay (s)		24.5	24.1		81.4			128.1			33.5	
Level of Service		C	C		F			F			C	
Approach Delay (s)		24.2			81.4			128.1			33.5	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	76.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	43	60	61	1126	1342	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.92			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1772			3567	3557	
Flt Permitted	0.98			0.79	1.00	
Satd. Flow (perm)	1772			2826	3557	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.99	0.99
Adj. Flow (vph)	47	65	66	1224	1356	47
RTOR Reduction (vph)	49	0	0	0	2	0
Lane Group Flow (vph)	63	0	0	1290	1401	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.1			44.5	44.5	
Effective Green, g (s)	6.1			44.5	44.5	
Actuated g/C Ratio	0.09			0.66	0.66	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	160			1871	2355	
v/s Ratio Prot	c0.04				0.39	
v/s Ratio Perm				c0.46		
v/c Ratio	0.39			0.69	0.59	
Uniform Delay, d1	28.8			7.1	6.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.6			1.1	0.4	
Delay (s)	30.4			8.1	6.7	
Level of Service	C			A	A	
Approach Delay (s)	30.4			8.1	6.7	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	159	0	5	0	1236	39	3	1602	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	12	12	12	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					1.00			1.00			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2026			3503			3455	
Flt Permitted					0.95			1.00			0.95	
Satd. Flow (perm)					2026			3503			3293	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	173	0	5	0	1343	42	3	1652	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	155	0	0	1383	0	0	1655	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	2%	21%	0%	1%	0%
Turn Type				Perm	NA			NA		Perm	NA	
Protected Phases					3			1			1	
Permitted Phases				3			1			1		
Actuated Green, G (s)					10.9			50.0			50.0	
Effective Green, g (s)					10.9			50.0			50.0	
Actuated g/C Ratio					0.15			0.71			0.71	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					311			2470			2322	
v/s Ratio Prot								0.39				
v/s Ratio Perm					0.08						c0.50	
v/c Ratio					0.50			0.56			0.71	
Uniform Delay, d1					27.5			5.1			6.2	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					1.3			0.3			1.1	
Delay (s)					28.8			5.4			7.3	
Level of Service					C			A			A	
Approach Delay (s)		0.0			28.8			5.4			7.3	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	15	1	1250	1590	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.99	0.99
Hourly flow rate (vph)	1	16	1	1359	1606	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				314		
pX, platoon unblocked	0.80					
vC, conflicting volume	2289	805	1609			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2110	805	1609			
tC, single (s)	6.8	7.0	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	95	100			
cM capacity (veh/h)	36	319	411			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	454	906	1071	538
Volume Left	1	1	0	0	0
Volume Right	16	0	0	0	3
cSH	214	411	1700	1700	1700
Volume to Capacity	0.08	0.00	0.53	0.63	0.32
Queue Length 95th (ft)	7	0	0	0	0
Control Delay (s)	23.3	0.1	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	23.3	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Route 99 & Horizon Way

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	52	130	124	39	56
Average Queue (ft)	15	37	33	2	3
95th Queue (ft)	45	175	167	26	29
Link Distance (ft)	162	259	259	460	460
Upstream Blk Time (%)		1	1		
Queuing Penalty (veh)		6	4		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Bow Street & Mystic Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	149	164	104	98
Average Queue (ft)	88	88	12	6
95th Queue (ft)	377	378	63	49
Link Distance (ft)	460	460	307	307
Upstream Blk Time (%)	4	4		
Queuing Penalty (veh)	27	27		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	144	251	221	240	260
Average Queue (ft)	88	109	76	111	131
95th Queue (ft)	142	224	191	217	231
Link Distance (ft)	124	728	728	259	259
Upstream Blk Time (%)	3			0	0
Queuing Penalty (veh)	0			1	1
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 368

Build (2023) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	0	487	0	0	0	429	1549	211	39	1541	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0				5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.88				0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85				1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787				3319	3360		1711	3421	1531
Flt Permitted	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787				3319	3360		1711	3421	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	203	0	529	0	0	0	466	1684	229	39	1557	262
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	101	102	529	0	0	0	466	1913	0	39	1557	262
Turn Type	Split	NA	pt+ov				Prot	NA		Prot	NA	Prot
Protected Phases	4	4	4 5				5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	8.0	8.0	36.2				28.2	82.5		4.7	59.0	59.0
Effective Green, g (s)	8.0	8.0	36.2				28.2	82.5		4.7	59.0	59.0
Actuated g/C Ratio	0.07	0.07	0.30				0.23	0.69		0.04	0.49	0.49
Clearance Time (s)	5.0	5.0					5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	112	112	840				779	2310		67	1681	752
v/s Ratio Prot	0.06	c0.06	c0.19				0.14	c0.57		0.02	c0.46	0.17
v/s Ratio Perm												
v/c Ratio	0.90	0.91	0.63				0.60	0.83		0.58	0.93	0.35
Uniform Delay, d1	55.6	55.6	36.1				40.9	13.6		56.7	28.5	18.7
Progression Factor	1.00	1.00	1.00				1.29	0.67		1.00	1.00	1.00
Incremental Delay, d2	55.1	57.6	1.5				0.5	1.6		12.2	10.3	1.3
Delay (s)	110.8	113.3	37.6				53.2	10.7		68.9	38.7	20.0
Level of Service	F	F	D				D	B		E	D	B
Approach Delay (s)		58.2			0.0			19.0			36.7	
Approach LOS		E			A			B			D	

Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1720	1	0	1784	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1870	1	0	1939	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	341			933		
pX, platoon unblocked			0.58		0.78	0.58
vC, conflicting volume			1871		2840	935
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1062		527	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			356		379	636

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1246	624	646	1293
Volume Left	0	0	0	0
Volume Right	0	1	0	0
cSH	1700	1700	356	1700
Volume to Capacity	0.73	0.37	0.00	0.76
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↱			↲↑		
Volume (veh/h)	1717	3	0	1784	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1866	3	0	1939	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	703			571		
pX, platoon unblocked			0.58		0.77	0.58
vC, conflicting volume			1870		2838	935
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1050		547	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			389		361	629

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1244	625	646	1293
Volume Left	0	0	0	0
Volume Right	0	3	0	0
cSH	1700	1700	389	1700
Volume to Capacity	0.73	0.37	0.00	0.76
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2	48	283	17	43	36	1660	21	66	1453	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			1.00	
Flt Protected		0.95	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1814	1615		1699			3440			3431	
Flt Permitted		0.82	1.00		0.74			0.83			0.60	
Satd. Flow (perm)		1552	1615		1301			2867			2078	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	2	52	295	18	45	39	1804	23	72	1579	39
RTOR Reduction (vph)	0	0	42	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	41	10	0	353	0	0	1865	0	0	1689	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	5%	0%	1%	14%	5%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.0	20.0		20.0			26.8			61.8	
Effective Green, g (s)		20.0	20.0		20.0			26.8			61.8	
Actuated g/C Ratio		0.20	0.20		0.20			0.27			0.62	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		310	323		260			768			1690	
v/s Ratio Prot											c0.30	
v/s Ratio Perm		0.03	0.01		c0.27			c0.65			0.32	
v/c Ratio		0.13	0.03		1.36			2.43			1.00	
Uniform Delay, d1		32.9	32.2		40.0			36.6			19.1	
Progression Factor		1.00	1.00		1.00			1.00			1.46	
Incremental Delay, d2		0.2	0.0		184.3			646.9			19.4	
Delay (s)		33.1	32.2		224.3			683.5			47.3	
Level of Service		C	C		F			F			D	
Approach Delay (s)		32.6			224.3			683.5			47.3	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	359.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	45	50	77	1661	1506	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1782			3568	3546	
Flt Permitted	0.98			0.68	1.00	
Satd. Flow (perm)	1782			2439	3546	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.92	0.92
Adj. Flow (vph)	49	54	82	1767	1637	58
RTOR Reduction (vph)	40	0	0	0	1	0
Lane Group Flow (vph)	63	0	0	1849	1694	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4			75.4	75.4	
Effective Green, g (s)	6.4			75.4	75.4	
Actuated g/C Ratio	0.06			0.75	0.75	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	114			1839	2673	
v/s Ratio Prot	c0.04				0.48	
v/s Ratio Perm				c0.76		
v/c Ratio	0.55			1.01	0.63	
Uniform Delay, d1	45.4			12.3	5.8	
Progression Factor	1.00			3.30	1.00	
Incremental Delay, d2	5.6			7.7	1.2	
Delay (s)	51.0			48.2	6.9	
Level of Service	D			D	A	
Approach Delay (s)	51.0			48.2	6.9	
Approach LOS	D			D	A	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	337	0	0	337	344	344
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	366	0	0	366	374	374
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					431	
pX, platoon unblocked						
vC, conflicting volume	744	374	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	744	374	748			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	350	624	857			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	366	0	122	244	249	499
Volume Left	366	0	0	0	0	0
Volume Right	0	0	0	0	0	374
cSH	350	1700	857	1700	1700	1700
Volume to Capacity	1.05	0.00	0.00	0.14	0.15	0.29
Queue Length 95th (ft)	319	0	0	0	0	0
Control Delay (s)	96.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	96.0		0.0		0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	23.8		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	0	14	0	2175	77	8	2020	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2003			3379			3421	
Flt Permitted					0.74			1.00			0.91	
Satd. Flow (perm)					1547			3379			3123	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	266	0	15	0	2266	80	8	2061	0
RTOR Reduction (vph)	0	0	0	0	53	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	228	0	0	2344	0	0	2069	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					21.0			89.0			89.0	
Effective Green, g (s)					21.0			89.0			89.0	
Actuated g/C Ratio					0.18			0.74			0.74	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					270			2506			2316	
v/s Ratio Prot								c0.69				
v/s Ratio Perm					c0.15						0.66	
v/c Ratio					0.85			0.94			0.89	
Uniform Delay, d1					47.9			13.1			11.9	
Progression Factor					1.00			1.00			0.67	
Incremental Delay, d2					20.8			8.1			3.6	
Delay (s)					68.8			21.2			11.5	
Level of Service					E			C			B	
Approach Delay (s)		0.0			68.8			21.2			11.5	
Approach LOS		A			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	B125	B125	B125	B125	NB	NB	NB	NB
Directions Served	L	LT	R	R	T	T	T	T	L	L	T	TR
Maximum Queue (ft)	290	266	237	220	139	121	66	87	173	246	460	469
Average Queue (ft)	244	214	99	78	70	42	7	6	64	90	388	395
95th Queue (ft)	355	328	239	216	148	110	48	46	145	185	536	533
Link Distance (ft)	180	180	180	180	53	53	53	53	414	414	414	414
Upstream Blk Time (%)	80	73	6	5	67	43	2	1		0	23	26
Queuing Penalty (veh)	136	123	11	9	114	73	3	2		0	126	142
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	74	303	302	236
Average Queue (ft)	31	261	264	93
95th Queue (ft)	75	336	330	185
Link Distance (ft)		267	267	267
Upstream Blk Time (%)		22	23	0
Queuing Penalty (veh)		132	138	2
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	7	42		
Queuing Penalty (veh)	52	16		

Intersection: 2: Mystic Street & Bow Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	303	319	331	339
Average Queue (ft)	278	281	201	213
95th Queue (ft)	372	376	409	411
Link Distance (ft)	267	267	306	306
Upstream Blk Time (%)	52	55	12	13
Queuing Penalty (veh)	455	473	110	117
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Bow Street & Lynde Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	44
Average Queue (ft)	8
95th Queue (ft)	32
Link Distance (ft)	33
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	343	346	498	520
Average Queue (ft)	313	315	164	173
95th Queue (ft)	351	351	517	525
Link Distance (ft)	306	306	510	510
Upstream Blk Time (%)	55	57	5	6
Queuing Penalty (veh)	476	487	46	51
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bow Street & Thorndike Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	39
Average Queue (ft)	20
95th Queue (ft)	44
Link Distance (ft)	87
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	55	55	668	540	557	693	677
Average Queue (ft)	22	31	483	520	525	457	443
95th Queue (ft)	52	61	873	533	542	826	828
Link Distance (ft)	40	40	728	510	510	715	715
Upstream Blk Time (%)	7	9	15	58	59	8	10
Queuing Penalty (veh)	0	0	57	500	508	66	75
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	128	238	225	228	230
Average Queue (ft)	91	75	65	151	134
95th Queue (ft)	150	181	182	279	273
Link Distance (ft)	113	715	715	201	201
Upstream Blk Time (%)	34			23	24
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Robin Street & Beacham Street/Beaham Street

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	3	215	337	31	57
Average Queue (ft)	0	103	167	1	6
95th Queue (ft)	1	256	520	13	36
Link Distance (ft)	728	230	634	153	153
Upstream Blk Time (%)		16	11		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11:

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	LT	T	TR
Maximum Queue (ft)	434	347	392	544	4
Average Queue (ft)	291	183	123	164	0
95th Queue (ft)	552	528	329	514	3
Link Distance (ft)	419	419	527	527	53
Upstream Blk Time (%)	50	39	2	15	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	T	TR	LT	T
Maximum Queue (ft)	132	759	781	498	466
Average Queue (ft)	107	694	748	189	197
95th Queue (ft)	123	921	765	499	490
Link Distance (ft)	97	728	728	414	414
Upstream Blk Time (%)	88	19	68	7	9
Queuing Penalty (veh)	0	0	0	69	92
Storage Bay Dist (ft)					
Storage Blk Time (%)		2			
Queuing Penalty (veh)		0			

Network Summary

Network wide Queuing Penalty: 4663

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	0	572	0	0	0	512	1140	101	40	1605	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0				5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.88				0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85				1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787				3319	3379		1711	3421	1531
Flt Permitted	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787				3319	3379		1711	3421	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	241	0	622	0	0	0	557	1239	110	40	1621	317
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	93
Lane Group Flow (vph)	120	121	622	0	0	0	557	1345	0	40	1621	224
Turn Type	Split	NA	pt+ov				Prot	NA		Prot	NA	Prot
Protected Phases	4	4	4 5				5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	13.6	13.6	40.6				22.0	76.0		5.6	59.6	59.6
Effective Green, g (s)	13.6	13.6	40.6				22.0	76.0		5.6	59.6	59.6
Actuated g/C Ratio	0.11	0.11	0.34				0.18	0.63		0.05	0.50	0.50
Clearance Time (s)	5.0	5.0					5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	190	190	942				608	2140		79	1699	760
v/s Ratio Prot	0.07	0.07	c0.22				c0.17	0.40		0.02	c0.47	0.15
v/s Ratio Perm												
v/c Ratio	0.63	0.64	0.66				0.92	0.63		0.51	0.95	0.30
Uniform Delay, d1	50.8	50.8	33.8				48.1	13.4		55.9	28.9	17.8
Progression Factor	1.00	1.00	1.00				1.00	0.63		1.00	1.00	1.00
Incremental Delay, d2	6.7	6.8	1.7				16.8	1.2		5.0	13.4	1.0
Delay (s)	57.5	57.7	35.6				65.1	9.7		60.9	42.3	18.8
Level of Service	E	E	D				E	A		E	D	B
Approach Delay (s)		41.7			0.0			25.9			38.9	
Approach LOS		D			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↱			↰↑		
Volume (veh/h)	1406	3	0	1936	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1528	3	0	2104	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	332			933		
pX, platoon unblocked			0.76		0.63	0.76
vC, conflicting volume			1532		2582	766
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1066		633	57
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			463		264	762

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1019	513	701	1403
Volume Left	0	0	0	0
Volume Right	0	3	0	0
cSH	1700	1700	463	1700
Volume to Capacity	0.60	0.30	0.00	0.83
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	4	0	0	0	0	0	90	19	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	4	0	0	0	0	0	98	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	108	118	0	110	108	108	0			118		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	108	118	0	110	108	108	0			118		
tC, single (s)	7.1	6.7	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.2	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	100	100	100			100		
cM capacity (veh/h)	875	745	1091	869	786	951	1636			1482		

Direction, Lane #	EB 1	NB 1
Volume Total	16	118
Volume Left	12	0
Volume Right	0	21
cSH	836	1700
Volume to Capacity	0.02	0.07
Queue Length 95th (ft)	1	0
Control Delay (s)	9.4	0.0
Lane LOS	A	
Approach Delay (s)	9.4	0.0
Approach LOS	A	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1399	7	0	1936	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1521	8	0	2104	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	694			571		
pX, platoon unblocked			0.76		0.62	0.76
vC, conflicting volume			1528		2577	764
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1069		607	66
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			459		267	750

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1014	514	701	1403
Volume Left	0	0	0	0
Volume Right	0	8	0	0
cSH	1700	1700	459	1700
Volume to Capacity	0.60	0.30	0.00	0.83
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	6	0	0	0	0	0	101	9	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	7	0	0	0	0	0	110	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	115	120	0	118	115	115	0			120		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115	120	0	118	115	115	0			120		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	100	100	100			100		
cM capacity (veh/h)	851	774	1091	853	776	938	1636			1468		

Direction, Lane #	EB 1	NB 1
Volume Total	18	120
Volume Left	12	0
Volume Right	0	10
cSH	822	1700
Volume to Capacity	0.02	0.07
Queue Length 95th (ft)	2	0
Control Delay (s)	9.5	0.0
Lane LOS	A	
Approach Delay (s)	9.5	0.0
Approach LOS	A	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	13	56	265	20	35	36	1335	28	34	1615	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.99			1.00			1.00	
Flt Protected		0.97	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1836	1615		1683			3442			3467	
Flt Permitted		0.80	1.00		0.73			0.70			0.69	
Satd. Flow (perm)		1521	1615		1280			2425			2379	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	33	14	61	282	21	37	39	1451	30	35	1665	57
RTOR Reduction (vph)	0	0	46	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	47	15	0	336	0	0	1519	0	0	1755	0
Heavy Vehicles (%)	0%	0%	0%	7%	0%	9%	0%	1%	0%	0%	0%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.3	20.3		20.3			30.5			45.6	
Effective Green, g (s)		20.3	20.3		20.3			30.5			45.6	
Actuated g/C Ratio		0.24	0.24		0.24			0.37			0.55	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		370	393		311			887			1434	
v/s Ratio Prot											c0.15	
v/s Ratio Perm		0.03	0.01		c0.26			c0.63			0.52	
v/c Ratio		0.13	0.04		1.08			1.71			1.22	
Uniform Delay, d1		24.6	24.0		31.5			26.4			18.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.2	0.0		74.4			325.3			107.2	
Delay (s)		24.7	24.1		105.9			351.7			126.1	
Level of Service		C	C		F			F			F	
Approach Delay (s)		24.4			105.9			351.7			126.1	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	213.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	43	60	61	1325	1644	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.92			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1772			3568	3560	
Flt Permitted	0.98			0.73	1.00	
Satd. Flow (perm)	1772			2604	3560	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.99	0.99
Adj. Flow (vph)	47	65	66	1440	1661	47
RTOR Reduction (vph)	50	0	0	0	1	0
Lane Group Flow (vph)	62	0	0	1506	1707	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.2			58.3	58.3	
Effective Green, g (s)	6.2			58.3	58.3	
Actuated g/C Ratio	0.08			0.71	0.71	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	134			1855	2537	
v/s Ratio Prot	c0.04				0.48	
v/s Ratio Perm				c0.58		
v/c Ratio	0.46			0.81	0.67	
Uniform Delay, d1	36.2			8.0	6.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.5			2.8	0.7	
Delay (s)	38.7			10.8	7.2	
Level of Service	D			B	A	
Approach Delay (s)	38.7			10.8	7.2	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	81.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	116	37	183	295	0	15	0	44	2	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	40	199	321	0	16	0	48	2	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		821										
pX, platoon unblocked												
vC, conflicting volume	321			166			869	865	146	912	885	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			166			869	865	146	912	885	321
tC, single (s)	4.1			4.1			7.1	6.5	6.4	8.1	6.5	7.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	4.4	4.0	4.2
p0 queue free %	100			86			93	100	94	99	100	99
cM capacity (veh/h)	1251			1418			243	253	863	147	246	541

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	166	520	64	2	4
Volume Left	0	199	16	2	0
Volume Right	40	0	48	0	4
cSH	1251	1418	523	147	541
Volume to Capacity	0.00	0.14	0.12	0.01	0.01
Queue Length 95th (ft)	0	12	10	1	1
Control Delay (s)	0.0	3.9	12.8	29.9	11.7
Lane LOS		A	B	D	B
Approach Delay (s)	0.0	3.9	12.8	17.8	
Approach LOS			B	C	

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	397	0	0	397	413	413
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	432	0	0	432	449	449
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					471	
pX, platoon unblocked						
vC, conflicting volume	889	449	898			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	889	449	898			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	283	557	752			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	432	0	144	288	299	599
Volume Left	432	0	0	0	0	0
Volume Right	0	0	0	0	0	449
cSH	283	1700	752	1700	1700	1700
Volume to Capacity	1.53	0.00	0.00	0.17	0.18	0.35
Queue Length 95th (ft)	627	0	0	0	0	0
Control Delay (s)	287.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	287.2		0.0		0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	70.4		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	159	0	5	0	1748	39	3	2174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.91			0.95	
Frt					1.00			1.00			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2026			4880			3455	
Flt Permitted					0.73			1.00			0.95	
Satd. Flow (perm)					1555			4880			3290	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	173	0	5	0	1900	42	3	2241	0
RTOR Reduction (vph)	0	0	0	0	56	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	122	0	0	1941	0	0	2244	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	2%	21%	0%	1%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					15.5			94.5			94.5	
Effective Green, g (s)					15.5			94.5			94.5	
Actuated g/C Ratio					0.13			0.79			0.79	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					200			3843			2590	
v/s Ratio Prot								0.40				
v/s Ratio Perm					c0.08						c0.68	
v/c Ratio					0.61			0.51			0.87	
Uniform Delay, d1					49.4			4.5			8.5	
Progression Factor					1.00			1.00			1.07	
Incremental Delay, d2					5.4			0.5			2.4	
Delay (s)					54.8			5.0			11.5	
Level of Service					D			A			B	
Approach Delay (s)		0.0			54.8			5.0			11.5	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	B129	B129	B129	B129	NB	NB	NB	NB
Directions Served	L	LT	R	R	T	T	T	T	L	L	T	TR
Maximum Queue (ft)	318	271	271	271	30	14	27	20	424	447	487	478
Average Queue (ft)	198	173	169	147	13	3	1	1	154	239	417	422
95th Queue (ft)	334	304	269	270	70	25	14	10	335	453	548	551
Link Distance (ft)	261	261	261	261	68	68	68	68	427	427	427	427
Upstream Blk Time (%)	17	12	1	1	8	1	0	0	0	2	21	24
Queuing Penalty (veh)	34	24	3	2	16	2	0	0	1	7	90	105
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	74	290	298	243
Average Queue (ft)	32	268	270	113
95th Queue (ft)	73	284	289	217
Link Distance (ft)		264	264	264
Upstream Blk Time (%)		31	32	0
Queuing Penalty (veh)		200	203	3
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	9	48		
Queuing Penalty (veh)	71	19		

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	307	314	323	330
Average Queue (ft)	289	292	274	284
95th Queue (ft)	311	316	399	391
Link Distance (ft)	264	264	306	306
Upstream Blk Time (%)	45	50	19	21
Queuing Penalty (veh)	307	340	184	200
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	337	348	500	505
Average Queue (ft)	317	320	276	293
95th Queue (ft)	329	339	628	640
Link Distance (ft)	306	306	510	510
Upstream Blk Time (%)	46	48	5	5
Queuing Penalty (veh)	324	337	46	52
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	55	55	420	544	550	745	742
Average Queue (ft)	23	32	199	522	527	540	537
95th Queue (ft)	53	62	376	533	544	888	894
Link Distance (ft)	40	40	728	510	510	715	715
Upstream Blk Time (%)	5	9		48	49	7	8
Queuing Penalty (veh)	0	0		336	340	59	70
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	128	355	349	240	235
Average Queue (ft)	59	132	131	174	164
95th Queue (ft)	109	282	289	289	287
Link Distance (ft)	113	715	715	201	201
Upstream Blk Time (%)	3			30	35
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Site Driveway

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	194	79	33	31	4	4
Average Queue (ft)	133	25	8	1	0	0
95th Queue (ft)	214	124	50	19	3	3
Link Distance (ft)	164	164	204	204	68	68
Upstream Blk Time (%)	21	4				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	NB	SB	SB
Directions Served	LTR	T	T	TR	LT	T
Maximum Queue (ft)	125	750	775	784	446	431
Average Queue (ft)	92	509	706	725	267	270
95th Queue (ft)	139	980	930	876	457	447
Link Distance (ft)	100	728	728	728	427	427
Upstream Blk Time (%)	19	7	72	83	9	9
Queuing Penalty (veh)	0	0	0	0	93	98
Storage Bay Dist (ft)						
Storage Blk Time (%)		2				
Queuing Penalty (veh)		0				

Zone Summary

Zone wide Queuing Penalty: 3566

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations											
Volume (vph)	0	0	245	1549	211	39	1541	151	110	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11	11	11	12	12	12
Total Lost time (s)			5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.95		1.00	0.95	1.00	0.95	0.95	0.88
Frt			1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected			0.95	1.00		0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)			3319	3360		1711	3421	1531	1681	1681	2787
Flt Permitted			0.95	1.00		0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)			3319	3360		1711	3421	1531	1681	1681	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99	0.92	0.92	0.92
Adj. Flow (vph)	0	0	266	1684	229	39	1557	153	120	0	302
RTOR Reduction (vph)	0	0	0	6	0	0	0	59	0	0	0
Lane Group Flow (vph)	0	0	266	1907	0	39	1557	94	60	60	302
Turn Type			Prot	NA		Prot	NA	Perm	Prot	Prot	pt+ov
Protected Phases			5	2		1	6		4	4	4 5
Permitted Phases								6			
Actuated Green, G (s)			13.8	82.5		4.7	73.4	73.4	8.0	8.0	21.8
Effective Green, g (s)			13.8	82.5		4.7	73.4	73.4	8.0	8.0	21.8
Actuated g/C Ratio			0.12	0.69		0.04	0.61	0.61	0.07	0.07	0.18
Clearance Time (s)			5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)			3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			381	2310		67	2092	936	112	112	506
v/s Ratio Prot			c0.08	c0.57		0.02	0.46		0.04	0.04	c0.11
v/s Ratio Perm								0.06			
v/c Ratio			0.70	0.83		0.58	0.74	0.10	0.54	0.54	0.60
Uniform Delay, d1			51.1	13.6		56.7	16.6	9.6	54.2	54.2	45.1
Progression Factor			1.25	0.36		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2			2.9	1.9		12.2	2.5	0.2	4.9	4.9	1.9
Delay (s)			66.8	6.8		68.9	19.1	9.9	59.1	59.1	47.0
Level of Service			E	A		E	B	A	E	E	D
Approach Delay (s)	0.0			14.1			19.4			50.4	
Approach LOS	A			B			B			D	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	1642	1	0	1676	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1785	1	0	1822	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	341			933		
pX, platoon unblocked			0.58		0.75	0.58
vC, conflicting volume			1786		2696	893
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			918		579	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			406		338	636

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1190	596	607	1214
Volume Left	0	0	0	0
Volume Right	0	1	0	0
cSH	1700	1700	406	1700
Volume to Capacity	0.70	0.35	0.00	0.71
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↱			↰↑		
Volume (veh/h)	1639	3	0	1676	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1782	3	0	1822	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	703			571		
pX, platoon unblocked			0.58		0.75	0.58
vC, conflicting volume			1785		2694	892
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			905		582	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			441		331	629

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1188	597	607	1214
Volume Left	0	0	0	0
Volume Right	0	3	0	0
cSH	1700	1700	441	1700
Volume to Capacity	0.70	0.35	0.00	0.71
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2	48	277	17	43	36	1588	15	66	1351	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.98			1.00			1.00	
Flt Protected		0.95	1.00		0.96			1.00			1.00	
Satd. Flow (prot)		1814	1615		1699			3443			3429	
Flt Permitted		0.81	1.00		0.74			0.84			0.60	
Satd. Flow (perm)		1540	1615		1302			2898			2077	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	2	52	289	18	45	39	1726	16	72	1468	39
RTOR Reduction (vph)	0	0	42	0	6	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	41	10	0	346	0	0	1780	0	0	1578	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	5%	0%	1%	14%	5%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		20.0	20.0		20.0			26.8			61.8	
Effective Green, g (s)		20.0	20.0		20.0			26.8			61.8	
Actuated g/C Ratio		0.20	0.20		0.20			0.27			0.62	
Clearance Time (s)		5.0	5.0		5.0			5.0				
Vehicle Extension (s)		3.0	3.0		3.0			3.0				
Lane Grp Cap (vph)		308	323		260			776			1689	
v/s Ratio Prot											c0.28	
v/s Ratio Perm		0.03	0.01		c0.27			c0.61			0.30	
v/c Ratio		0.13	0.03		1.33			2.29			0.93	
Uniform Delay, d1		32.9	32.2		40.0			36.6			17.3	
Progression Factor		1.00	1.00		1.00			1.00			1.36	
Incremental Delay, d2		0.2	0.0		173.5			586.5			8.7	
Delay (s)		33.1	32.2		213.5			623.1			32.2	
Level of Service		C	C		F			F			C	
Approach Delay (s)		32.6			213.5			623.1			32.2	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	325.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	121.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	45	50	77	1589	1404	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0			5.0	5.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1782			3568	3544	
Flt Permitted	0.98			0.70	1.00	
Satd. Flow (perm)	1782			2513	3544	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.92	0.92
Adj. Flow (vph)	49	54	82	1690	1526	58
RTOR Reduction (vph)	40	0	0	0	1	0
Lane Group Flow (vph)	63	0	0	1772	1583	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4			75.4	75.4	
Effective Green, g (s)	6.4			75.4	75.4	
Actuated g/C Ratio	0.06			0.75	0.75	
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	114			1894	2672	
v/s Ratio Prot	c0.04				0.45	
v/s Ratio Perm				c0.71		
v/c Ratio	0.55			0.94	0.59	
Uniform Delay, d1	45.4			10.3	5.5	
Progression Factor	1.00			3.26	1.00	
Incremental Delay, d2	5.6			1.2	1.0	
Delay (s)	51.0			34.6	6.4	
Level of Service	D			C	A	
Approach Delay (s)	51.0			34.6	6.4	
Approach LOS	D			C	A	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	0	14	0	1991	77	8	1811	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2003			3375			3421	
Flt Permitted					0.74			1.00			0.94	
Satd. Flow (perm)					1547			3375			3206	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	266	0	15	0	2074	80	8	1848	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	229	0	0	2153	0	0	1856	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					23.0			87.0			87.0	
Effective Green, g (s)					23.0			87.0			87.0	
Actuated g/C Ratio					0.19			0.72			0.72	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					296			2446			2324	
v/s Ratio Prot								c0.64				
v/s Ratio Perm					c0.15						0.58	
v/c Ratio					0.77			0.88			0.80	
Uniform Delay, d1					46.0			12.5			10.8	
Progression Factor					1.00			1.00			0.74	
Incremental Delay, d2					11.9			4.9			2.2	
Delay (s)					58.0			17.5			10.2	
Level of Service					E			B			B	
Approach Delay (s)		0.0			58.0			17.5			10.2	
Approach LOS		A			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	194	0	0	194	198	198
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	0	0	211	215	215
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					341	
pX, platoon unblocked						
vC, conflicting volume	428	215	430			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428	215	430			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	100	100			
cM capacity (veh/h)	555	790	1125			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	211	0	70	141	143	287
Volume Left	211	0	0	0	0	0
Volume Right	0	0	0	0	0	215
cSH	555	1700	1125	1700	1700	1700
Volume to Capacity	0.38	0.00	0.00	0.08	0.08	0.17
Queue Length 95th (ft)	44	0	0	0	0	0
Control Delay (s)	15.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.4		0.0		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	B125	B125	B125	B125	NB	NB	NB	NB
Directions Served	L	LT	R	R	T	T	T	T	L	L	T	TR
Maximum Queue (ft)	289	265	240	222	137	88	43	48	205	261	469	481
Average Queue (ft)	235	201	106	89	64	27	4	4	74	109	375	385
95th Queue (ft)	358	324	220	212	145	77	33	25	159	212	562	565
Link Distance (ft)	179	179	179	179	52	52	52	52	432	432	432	432
Upstream Blk Time (%)	74	66	6	5	60	29	1	1		0	15	17
Queuing Penalty (veh)	125	111	10	8	102	48	2	1		0	82	95
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	74	297	294	192
Average Queue (ft)	26	266	266	89
95th Queue (ft)	67	321	317	172
Link Distance (ft)		266	266	266
Upstream Blk Time (%)		25	26	
Queuing Penalty (veh)		150	157	
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	3	46		
Queuing Penalty (veh)	25	18		

Intersection: 2: Mystic Street & Bow Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Route 99 & Lynde Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	309	309	330	334
Average Queue (ft)	268	271	232	239
95th Queue (ft)	395	395	425	428
Link Distance (ft)	266	266	306	306
Upstream Blk Time (%)	48	51	16	17
Queuing Penalty (veh)	416	444	142	153
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Bow Street & Lynde Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	37
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	33
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	LT	T
Maximum Queue (ft)	334	346	482	484
Average Queue (ft)	307	310	238	248
95th Queue (ft)	376	381	618	628
Link Distance (ft)	306	306	510	510
Upstream Blk Time (%)	49	51	7	8
Queuing Penalty (veh)	425	441	62	72
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Bow Street & Thorndike Street

Movement	EB
Directions Served	LT
Maximum Queue (ft)	36
Average Queue (ft)	21
95th Queue (ft)	45
Link Distance (ft)	87
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	LT	TR	LT	TR
Maximum Queue (ft)	54	55	668	538	553	705	706
Average Queue (ft)	22	33	496	520	524	478	466
95th Queue (ft)	54	62	873	532	539	843	846
Link Distance (ft)	40	40	728	510	510	715	715
Upstream Blk Time (%)	6	13	21	54	55	9	9
Queuing Penalty (veh)	0	0	80	467	474	71	70
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	125	243	259	232	228
Average Queue (ft)	80	81	68	149	140
95th Queue (ft)	135	192	191	276	281
Link Distance (ft)	113	715	715	201	201
Upstream Blk Time (%)	16			23	25
Queuing Penalty (veh)	0			0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Robin Street & Beacham Street/Beaham Street

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	2	202	368	30	48
Average Queue (ft)	0	118	230	1	4
95th Queue (ft)	1	287	658	13	26
Link Distance (ft)	728	230	634	153	153
Upstream Blk Time (%)		27	23		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Site Garage Driveway

Movement	EB	EB	NB	NB
Directions Served	L	R	LT	T
Maximum Queue (ft)	454	438	235	400
Average Queue (ft)	281	195	72	68
95th Queue (ft)	557	544	191	275
Link Distance (ft)	419	419	527	527
Upstream Blk Time (%)	46	43		0
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	T	TR	LT	T
Maximum Queue (ft)	133	768	776	510	479
Average Queue (ft)	107	683	749	209	207
95th Queue (ft)	124	944	767	520	501
Link Distance (ft)	97	728	728	432	432
Upstream Blk Time (%)	88	13	64	15	13
Queuing Penalty (veh)	0	0	0	153	128
Storage Bay Dist (ft)					
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Network Summary

Network wide Queuing Penalty: 4531

Build (2023) Mitigated Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	0	487	0	0	0	429	1549	211	39	1541	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0				5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.88				0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85				1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787				3319	3360		1711	3421	1531
Flt Permitted	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787				3319	3360		1711	3421	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	203	0	529	0	0	0	466	1684	229	39	1557	262
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	101	102	529	0	0	0	466	1913	0	39	1557	262
Turn Type	Split	NA	pt+ov				Prot	NA		Prot	NA	Prot
Protected Phases	4	4	4 5				5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	13.8	13.8	37.8				19.0	76.7		4.7	62.4	62.4
Effective Green, g (s)	13.8	13.8	37.8				19.0	76.7		4.7	62.4	62.4
Actuated g/C Ratio	0.12	0.12	0.31				0.16	0.64		0.04	0.52	0.52
Clearance Time (s)	5.0	5.0					5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	193	193	877				525	2147		67	1778	796
v/s Ratio Prot	0.06	0.06	c0.19				0.14	c0.57		0.02	c0.46	0.17
v/s Ratio Perm												
v/c Ratio	0.52	0.53	0.60				0.89	0.89		0.58	0.88	0.33
Uniform Delay, d1	50.0	50.0	34.8				49.5	18.1		56.7	25.4	16.7
Progression Factor	1.00	1.00	1.00				0.74	0.25		0.86	1.13	0.90
Incremental Delay, d2	2.5	2.6	1.2				7.6	2.6		7.4	3.9	0.7
Delay (s)	52.6	52.6	35.9				44.0	7.2		56.0	32.5	15.7
Level of Service	D	D	D				D	A		E	C	B
Approach Delay (s)		40.6			0.0			14.4			30.6	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2	48	283	17	43	36	1660	21	66	1453	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1615		1699		1745	3443		1662	3443	
Flt Permitted		0.83	1.00		0.74		0.07	1.00		0.06	1.00	
Satd. Flow (perm)		1576	1615		1301		136	3443		102	3443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	2	52	295	18	45	39	1804	23	72	1579	39
RTOR Reduction (vph)	0	0	42	0	4	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	41	10	0	354	0	39	1827	0	72	1617	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	5%	0%	1%	14%	5%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		23.0	23.0		23.0		63.6	63.6		77.6	77.6	
Effective Green, g (s)		23.0	23.0		23.0		63.6	63.6		77.6	77.6	
Actuated g/C Ratio		0.19	0.19		0.19		0.53	0.53		0.65	0.65	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0		
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0		
Lane Grp Cap (vph)		302	309		249		72	1824		182	2226	
v/s Ratio Prot								c0.53		0.03	c0.47	
v/s Ratio Perm		0.03	0.01		c0.27		0.29			0.22		
v/c Ratio		0.14	0.03		1.42		0.54	1.00		0.40	0.73	
Uniform Delay, d1		40.3	39.4		48.5		18.6	28.2		47.3	14.1	
Progression Factor		1.00	1.00		1.00		0.54	0.76		0.89	0.81	
Incremental Delay, d2		0.2	0.0		211.5		16.4	16.6		1.1	1.0	
Delay (s)		40.5	39.5		260.0		26.4	38.0		43.3	12.3	
Level of Service		D	D		F		C	D		D	B	
Approach Delay (s)		39.9			260.0			37.7			13.7	
Approach LOS		D			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	45	50	77	1661	1506	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1782		1805	3539	3546	
Flt Permitted	0.98		0.11	1.00	1.00	
Satd. Flow (perm)	1782		201	3539	3546	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.92	0.92
Adj. Flow (vph)	49	54	82	1767	1637	58
RTOR Reduction (vph)	34	0	0	0	1	0
Lane Group Flow (vph)	69	0	82	1767	1694	0
Heavy Vehicles (%)	0%	0%	0%	2%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	10.1		91.1	91.1	91.1	
Effective Green, g (s)	10.1		91.1	91.1	91.1	
Actuated g/C Ratio	0.08		0.76	0.76	0.76	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	149		152	2686	2692	
v/s Ratio Prot	c0.04			c0.50	0.48	
v/s Ratio Perm			0.41			
v/c Ratio	0.46		0.54	0.66	0.63	
Uniform Delay, d1	52.4		5.9	7.0	6.7	
Progression Factor	1.00		0.78	0.71	1.00	
Incremental Delay, d2	2.3		4.5	0.4	1.1	
Delay (s)	54.6		9.1	5.4	7.8	
Level of Service	D		A	A	A	
Approach Delay (s)	54.6			5.5	7.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	0	14	0	2175	101	8	2020	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2003			3366			3421	
Flt Permitted					0.74			1.00			0.89	
Satd. Flow (perm)					1547			3366			3050	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	266	0	15	0	2266	105	8	2061	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	229	0	0	2369	0	0	2069	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					21.6			88.4			88.4	
Effective Green, g (s)					21.6			88.4			88.4	
Actuated g/C Ratio					0.18			0.74			0.74	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					278			2479			2246	
v/s Ratio Prot								c0.70				
v/s Ratio Perm					c0.15						0.68	
v/c Ratio					0.82			0.96			0.92	
Uniform Delay, d1					47.4			14.1			12.9	
Progression Factor					1.00			1.00			1.18	
Incremental Delay, d2					17.5			10.3			5.3	
Delay (s)					64.8			24.3			20.6	
Level of Service					E			C			C	
Approach Delay (s)		0.0			64.8			24.3			20.6	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	B119	B119	NB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	R	T	T	L	L	T	TR	L	T
Maximum Queue (ft)	149	125	237	224	35	46	200	226	177	216	75	288
Average Queue (ft)	84	60	155	137	5	5	87	117	46	69	32	260
95th Queue (ft)	134	119	241	230	35	40	153	191	142	181	81	276
Link Distance (ft)	186	186	186	186	48	48	459	459	459	459		247
Upstream Blk Time (%)			10	8	3	2						45
Queuing Penalty (veh)			17	13	4	3						267
Storage Bay Dist (ft)											50	
Storage Blk Time (%)											9	61
Queuing Penalty (veh)											67	24

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	282	239
Average Queue (ft)	258	111
95th Queue (ft)	274	211
Link Distance (ft)	247	247
Upstream Blk Time (%)	46	0
Queuing Penalty (veh)	272	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Route 99 & Lynde Street

Movement	SB	SB	SB
Directions Served	T	T	T
Maximum Queue (ft)	315	327	29
Average Queue (ft)	286	289	1
95th Queue (ft)	348	346	16
Link Distance (ft)	278	278	278
Upstream Blk Time (%)	39	40	
Queuing Penalty (veh)	232	236	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Route 99 & Thorndike Street

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	575	580
Average Queue (ft)	497	503
95th Queue (ft)	707	704
Link Distance (ft)	544	544
Upstream Blk Time (%)	20	22
Queuing Penalty (veh)	178	193
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	49	49	745	136	307	316	150	744	735
Average Queue (ft)	21	30	689	41	134	150	64	527	521
95th Queue (ft)	52	59	905	109	249	266	161	898	893
Link Distance (ft)	34	34	722		544	544		716	716
Upstream Blk Time (%)	5	40	62					12	13
Queuing Penalty (veh)	0	0	239					95	105
Storage Bay Dist (ft)				175			125		
Storage Blk Time (%)				1	4		0	46	
Queuing Penalty (veh)				7	1		1	30	

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	122	122	122	133	234	246
Average Queue (ft)	89	40	24	21	171	159
95th Queue (ft)	139	92	79	84	288	293
Link Distance (ft)	107		716	716	202	202
Upstream Blk Time (%)	25				30	31
Queuing Penalty (veh)	0				0	0
Storage Bay Dist (ft)		125				
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		3	0			

Intersection: 11:

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	230	85	6	23	4	20
Average Queue (ft)	98	5	0	2	0	1
95th Queue (ft)	191	76	6	23	3	10
Link Distance (ft)	355	355	560	560	48	48
Upstream Blk Time (%)	1	1				0
Queuing Penalty (veh)	0	0				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	T	TR	LT	T
Maximum Queue (ft)	219	756	780	548	534
Average Queue (ft)	160	702	749	418	412
95th Queue (ft)	235	894	768	639	616
Link Distance (ft)	196	728	728	459	459
Upstream Blk Time (%)	9	13	60	22	40
Queuing Penalty (veh)	0	0	0	222	407
Storage Bay Dist (ft)					
Storage Blk Time (%)		5			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 2620

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	0	572	0	0	0	512	1140	101	32	1610	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0				5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.88				0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85				1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1715	1715	2707				3385	3410		1711	3455	1561
Flt Permitted	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1715	1715	2707				3385	3410		1711	3455	1561
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	0	622	0	0	0	557	1239	110	35	1750	338
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	91
Lane Group Flow (vph)	120	121	622	0	0	0	557	1345	0	35	1750	247
Heavy Vehicles (%)	0%	2%	5%	2%	2%	2%	0%	1%	2%	2%	1%	0%
Turn Type	Split	NA	pt+ov				Prot	NA		Prot	NA	Prot
Protected Phases	4	4	4 5				5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	14.7	14.7	39.7				20.0	75.9		4.6	60.5	60.5
Effective Green, g (s)	14.7	14.7	39.7				20.0	75.9		4.6	60.5	60.5
Actuated g/C Ratio	0.12	0.12	0.33				0.17	0.63		0.04	0.50	0.50
Clearance Time (s)	5.0	5.0					5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	210	210	895				564	2156		65	1741	787
v/s Ratio Prot	0.07	0.07	c0.23				c0.16	0.39		0.02	c0.51	0.16
v/s Ratio Perm												
v/c Ratio	0.57	0.58	0.69				0.99	0.62		0.54	1.01	0.31
Uniform Delay, d1	49.7	49.7	34.9				49.9	13.4		56.7	29.8	17.5
Progression Factor	1.00	1.00	1.00				0.86	0.46		1.09	0.77	0.32
Incremental Delay, d2	3.7	3.8	2.4				27.9	0.9		4.4	16.8	0.5
Delay (s)	53.4	53.5	37.2				71.0	7.1		66.1	39.7	6.1
Level of Service	D	D	D				E	A		E	D	A
Approach Delay (s)		41.8			0.0			25.8			34.8	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	13	56	265	20	35	36	1335	28	34	1615	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.99		1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1615		1755		1745	3445		1711	3439	
Flt Permitted		0.87	1.00		0.73		0.07	1.00		0.06	1.00	
Satd. Flow (perm)		1645	1615		1335		125	3445		113	3439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	14	61	288	22	38	39	1451	30	37	1755	60
RTOR Reduction (vph)	0	0	49	0	4	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	47	12	0	344	0	39	1480	0	37	1814	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	7%	0%	1%	0%	2%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		23.0	23.0		23.0		58.6	58.6		77.6	77.6	
Effective Green, g (s)		23.0	23.0		23.0		58.6	58.6		77.6	77.6	
Actuated g/C Ratio		0.19	0.19		0.19		0.49	0.49		0.65	0.65	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0		
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0		
Lane Grp Cap (vph)		315	309		255		61	1682		259	2223	
v/s Ratio Prot								c0.43		0.02	c0.53	
v/s Ratio Perm		0.03	0.01		c0.26		0.31			0.08		
v/c Ratio		0.15	0.04		1.35		0.64	0.88		0.14	0.82	
Uniform Delay, d1		40.4	39.5		48.5		22.8	27.5		33.3	15.9	
Progression Factor		1.00	1.00		1.00		0.82	0.95		0.97	0.85	
Incremental Delay, d2		0.2	0.1		180.7		36.2	6.0		0.2	1.8	
Delay (s)		40.6	39.5		229.2		54.9	32.1		32.4	15.3	
Level of Service		D	D		F		D	C		C	B	
Approach Delay (s)		40.0			229.2			32.7			15.6	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	43	60	61	1325	1644	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1772		1805	3574	3560	
Flt Permitted	0.98		0.08	1.00	1.00	
Satd. Flow (perm)	1772		160	3574	3560	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	65	66	1440	1787	51
RTOR Reduction (vph)	42	0	0	0	1	0
Lane Group Flow (vph)	70	0	66	1440	1837	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	10.0		91.2	91.2	91.2	
Effective Green, g (s)	10.0		91.2	91.2	91.2	
Actuated g/C Ratio	0.08		0.76	0.76	0.76	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	147		121	2716	2705	
v/s Ratio Prot	c0.04			0.40	c0.52	
v/s Ratio Perm			0.41			
v/c Ratio	0.48		0.55	0.53	0.68	
Uniform Delay, d1	52.5		5.9	5.8	7.1	
Progression Factor	1.00		0.91	0.39	1.00	
Incremental Delay, d2	2.4		9.0	0.4	1.4	
Delay (s)	54.9		14.3	2.7	8.5	
Level of Service	D		B	A	A	
Approach Delay (s)	54.9			3.2	8.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	397	0	0	397	412	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	1.00			1.00	0.93	
Flt Protected	0.95			1.00	1.00	
Satd. Flow (prot)	1770			3539	3274	
Flt Permitted	0.95			1.00	1.00	
Satd. Flow (perm)	1770			3539	3274	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	432	0	0	432	448	447
RTOR Reduction (vph)	0	0	0	0	268	0
Lane Group Flow (vph)	432	0	0	432	627	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4!			2	8!	
Permitted Phases		4	2			
Actuated Green, G (s)	16.0			16.0	16.0	
Effective Green, g (s)	16.0			16.0	16.0	
Actuated g/C Ratio	0.40			0.40	0.40	
Clearance Time (s)	4.0			4.0	4.0	
Lane Grp Cap (vph)	708			1415	1309	
v/s Ratio Prot	c0.24			c0.12	0.19	
v/s Ratio Perm						
v/c Ratio	0.61			0.31	0.48	
Uniform Delay, d1	9.5			8.2	8.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.9			0.6	1.3	
Delay (s)	13.4			8.8	10.2	
Level of Service	B			A	B	
Approach Delay (s)	13.4			8.8	10.2	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	159	0	5	0	1748	39	3	2174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					1.00			1.00			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2046			3428			3455	
Flt Permitted					0.73			1.00			0.95	
Satd. Flow (perm)					1571			3428			3291	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	173	0	5	0	1900	42	3	2363	0
RTOR Reduction (vph)	0	0	0	0	56	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	122	0	0	1941	0	0	2366	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	23%	0%	1%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					15.4			94.6			94.6	
Effective Green, g (s)					15.4			94.6			94.6	
Actuated g/C Ratio					0.13			0.79			0.79	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					201			2702			2594	
v/s Ratio Prot								0.57				
v/s Ratio Perm					c0.08						c0.72	
v/c Ratio					0.61			0.72			0.91	
Uniform Delay, d1					49.4			6.2			9.6	
Progression Factor					1.00			1.00			1.04	
Incremental Delay, d2					5.1			1.7			3.3	
Delay (s)					54.6			7.9			13.2	
Level of Service					D			A			B	
Approach Delay (s)		0.0			54.6			7.9			13.2	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 2: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	B129	B129	B42	B42	NB	NB	NB	NB
Directions Served	L	LT	R	R	T	T	T	T	L	L	T	TR
Maximum Queue (ft)	155	119	198	193	115	94	71	66	379	392	187	228
Average Queue (ft)	83	61	143	124	35	21	11	12	156	216	56	73
95th Queue (ft)	139	114	218	205	110	81	48	56	276	339	160	197
Link Distance (ft)	106	106	106	106	39	39	33	33	446	446	446	446
Upstream Blk Time (%)	4	2	35	31	19	12	7	6	0	0		
Queuing Penalty (veh)	8	3	70	62	37	25	14	11	0	0		
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: Route 99 & Site Driveway/Mystic Street

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	74	286	289	246
Average Queue (ft)	25	257	262	117
95th Queue (ft)	71	299	299	220
Link Distance (ft)		251	251	251
Upstream Blk Time (%)		38	40	1
Queuing Penalty (veh)		248	261	4
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	6	58		
Queuing Penalty (veh)	46	19		

Intersection: 3: Route 99 & Lynde Street

Movement	SB	SB	SB
Directions Served	T	T	T
Maximum Queue (ft)	339	341	329
Average Queue (ft)	271	276	71
95th Queue (ft)	431	425	280
Link Distance (ft)	306	306	306
Upstream Blk Time (%)	28	29	2
Queuing Penalty (veh)	181	187	11
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Route 99 & Thorndike Street

Movement	NB	NB	SB	SB
Directions Served	T	TR	T	T
Maximum Queue (ft)	45	48	536	537
Average Queue (ft)	4	5	370	375
95th Queue (ft)	47	53	726	734
Link Distance (ft)	306	306	510	510
Upstream Blk Time (%)			15	16
Queuing Penalty (veh)			147	156
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	49	49	732	176	386	412	150	746	749
Average Queue (ft)	27	35	529	53	196	212	34	537	537
95th Queue (ft)	55	60	822	148	367	386	112	917	930
Link Distance (ft)	34	34	722		510	510		716	716
Upstream Blk Time (%)	5	33	15		1	1		16	20
Queuing Penalty (veh)	0	0	48		5	7		134	167
Storage Bay Dist (ft)				175			125		
Storage Blk Time (%)				5	9			47	
Queuing Penalty (veh)				30	3			16	

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	122	102	160	187	246	234
Average Queue (ft)	88	39	23	26	178	167
95th Queue (ft)	145	86	93	106	292	297
Link Distance (ft)	107		716	716	202	202
Upstream Blk Time (%)	33				34	38
Queuing Penalty (veh)	0				0	0
Storage Bay Dist (ft)		125				
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		1	0			

Intersection: 10:

Movement	EB	EB	NB	NB	SB	SB	B42	B42	B129
Directions Served	L	R	LT	T	T	TR	T	T	T
Maximum Queue (ft)	467	474	83	177	152	169	39	102	26
Average Queue (ft)	434	418	33	74	118	116	5	16	1
95th Queue (ft)	492	571	66	146	167	188	24	65	13
Link Distance (ft)	421	421	368	368	33	33	39	39	106
Upstream Blk Time (%)	95	92			13	30	0	2	
Queuing Penalty (veh)	0	0			54	125	1	7	
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	T	TR	LT	T
Maximum Queue (ft)	112	761	774	538	520
Average Queue (ft)	92	693	747	346	338
95th Queue (ft)	132	926	761	603	578
Link Distance (ft)	97	728	728	446	446
Upstream Blk Time (%)	19	12	57	32	31
Queuing Penalty (veh)	0	0	0	352	334
Storage Bay Dist (ft)					
Storage Blk Time (%)		5			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 2774

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	0	487	0	0	0	429	1549	211	39	1541	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0				5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.88				0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85				1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1681	2787				3319	3360		1711	3421	1531
Flt Permitted	0.95	0.95	1.00				0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1681	2787				3319	3360		1711	3421	1531
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	203	0	529	0	0	0	466	1684	229	39	1557	262
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	101	102	529	0	0	0	466	1913	0	39	1557	262
Turn Type	Split	NA	pt+ov				Prot	NA		Prot	NA	Prot
Protected Phases	4	4	4 5				5	2		1	6	6
Permitted Phases												
Actuated Green, G (s)	13.8	13.8	37.8				19.0	76.7		4.7	62.4	62.4
Effective Green, g (s)	13.8	13.8	37.8				19.0	76.7		4.7	62.4	62.4
Actuated g/C Ratio	0.12	0.12	0.31				0.16	0.64		0.04	0.52	0.52
Clearance Time (s)	5.0	5.0					5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0					3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	193	193	877				525	2147		67	1778	796
v/s Ratio Prot	0.06	0.06	c0.19				0.14	c0.57		0.02	c0.46	0.17
v/s Ratio Perm												
v/c Ratio	0.52	0.53	0.60				0.89	0.89		0.58	0.88	0.33
Uniform Delay, d1	50.0	50.0	34.8				49.5	18.1		56.7	25.4	16.7
Progression Factor	1.00	1.00	1.00				0.74	0.25		0.86	1.13	0.90
Incremental Delay, d2	2.5	2.6	1.2				7.6	2.6		7.4	3.9	0.7
Delay (s)	52.6	52.6	35.9				44.0	7.2		56.0	32.5	15.7
Level of Service	D	D	D				D	A		E	C	B
Approach Delay (s)		40.6			0.0			14.4			30.6	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↱			↑↑↑		
Volume (veh/h)	1720	1	0	1784	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1870	1	0	1939	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	326			933		
pX, platoon unblocked			0.52		0.63	0.52
vC, conflicting volume			1871		2516	935
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			824		184	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			394		496	566

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1246	624	646	646	646
Volume Left	0	0	0	0	0
Volume Right	0	1	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.73	0.37	0.38	0.38	0.38
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↱			↑↑
Volume (veh/h)	0	0	1717	3	0	1784
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1866	3	0	1939
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			651			608
pX, platoon unblocked	0.68	0.52			0.52	
vC, conflicting volume	2838	935			1870	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574	0			810	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	306	560			426	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	1244	625	970	970
Volume Left	0	0	0	0
Volume Right	0	3	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.73	0.37	0.57	0.57
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2	48	283	17	43	36	1660	21	66	1453	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1615		1699		1745	3443		1662	3443	
Flt Permitted		0.83	1.00		0.74		0.07	1.00		0.06	1.00	
Satd. Flow (perm)		1576	1615		1301		136	3443		102	3443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	2	52	295	18	45	39	1804	23	72	1579	39
RTOR Reduction (vph)	0	0	42	0	4	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	41	10	0	354	0	39	1827	0	72	1617	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	5%	0%	1%	14%	5%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			4			2		1	1 6	
Permitted Phases	4		4	4			2			1 6		
Actuated Green, G (s)		23.0	23.0		23.0		63.6	63.6		77.6	77.6	
Effective Green, g (s)		23.0	23.0		23.0		63.6	63.6		77.6	77.6	
Actuated g/C Ratio		0.19	0.19		0.19		0.53	0.53		0.65	0.65	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0		
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0		
Lane Grp Cap (vph)		302	309		249		72	1824		182	2226	
v/s Ratio Prot								c0.53		0.03	c0.47	
v/s Ratio Perm		0.03	0.01		c0.27		0.29			0.22		
v/c Ratio		0.14	0.03		1.42		0.54	1.00		0.40	0.73	
Uniform Delay, d1		40.3	39.4		48.5		18.6	28.2		47.3	14.1	
Progression Factor		1.00	1.00		1.00		0.54	0.76		0.89	0.81	
Incremental Delay, d2		0.2	0.0		211.5		16.4	16.6		1.1	1.0	
Delay (s)		40.5	39.5		260.0		26.4	38.0		43.3	12.3	
Level of Service		D	D		F		C	D		D	B	
Approach Delay (s)		39.9			260.0			37.7			13.7	
Approach LOS		D			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	45	50	77	1661	1506	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	12	11
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1782		1805	3539	3546	
Flt Permitted	0.98		0.11	1.00	1.00	
Satd. Flow (perm)	1782		201	3539	3546	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.92	0.92
Adj. Flow (vph)	49	54	82	1767	1637	58
RTOR Reduction (vph)	34	0	0	0	1	0
Lane Group Flow (vph)	69	0	82	1767	1694	0
Heavy Vehicles (%)	0%	0%	0%	2%	1%	9%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	10.1		91.1	91.1	91.1	
Effective Green, g (s)	10.1		91.1	91.1	91.1	
Actuated g/C Ratio	0.08		0.76	0.76	0.76	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	149		152	2686	2692	
v/s Ratio Prot	c0.04			c0.50	0.48	
v/s Ratio Perm			0.41			
v/c Ratio	0.46		0.54	0.66	0.63	
Uniform Delay, d1	52.4		5.9	7.0	6.7	
Progression Factor	1.00		0.78	0.71	1.00	
Incremental Delay, d2	2.3		4.5	0.4	1.1	
Delay (s)	54.6		9.1	5.4	7.8	
Level of Service	D		A	A	A	
Approach Delay (s)	54.6			5.5	7.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	337	0	0	337	344	344
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	366	0	0	366	374	374
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked						
vC, conflicting volume	744	374	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	744	374	748			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	350	624	857			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	366	0	122	244	249	499
Volume Left	366	0	0	0	0	0
Volume Right	0	0	0	0	0	374
cSH	350	1700	857	1700	1700	1700
Volume to Capacity	1.05	0.00	0.00	0.14	0.15	0.29
Queue Length 95th (ft)	319	0	0	0	0	0
Control Delay (s)	96.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	96.0		0.0		0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	23.8		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	0	14	0	2175	101	8	2020	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					5.0			5.0			5.0	
Lane Util. Factor					1.00			0.95			0.95	
Frt					0.99			0.99			1.00	
Flt Protected					0.95			1.00			1.00	
Satd. Flow (prot)					2003			3366			3421	
Flt Permitted					0.74			1.00			0.89	
Satd. Flow (perm)					1547			3366			3050	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	266	0	15	0	2266	105	8	2061	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	229	0	0	2369	0	0	2069	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	2%	24%	0%	2%	0%
Turn Type				Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		1	6			2	
Permitted Phases	4			8						2		
Actuated Green, G (s)					21.6			88.4			88.4	
Effective Green, g (s)					21.6			88.4			88.4	
Actuated g/C Ratio					0.18			0.74			0.74	
Clearance Time (s)					5.0			5.0			5.0	
Vehicle Extension (s)					3.0			3.0			3.0	
Lane Grp Cap (vph)					278			2479			2246	
v/s Ratio Prot								c0.70				
v/s Ratio Perm					c0.15						0.68	
v/c Ratio					0.82			0.96			0.92	
Uniform Delay, d1					47.4			14.1			12.9	
Progression Factor					1.00			1.00			1.18	
Incremental Delay, d2					17.5			10.3			5.3	
Delay (s)					64.8			24.3			20.6	
Level of Service					E			C			C	
Approach Delay (s)		0.0			64.8			24.3			20.6	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Route 99 & Site Driveway/Mystic Street

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	R	L	L	T	TR	L	T	T	R
Maximum Queue (ft)	106	96	155	133	118	148	206	232	74	286	290	157
Average Queue (ft)	53	29	70	49	47	69	50	66	27	247	250	57
95th Queue (ft)	93	76	133	117	92	120	156	184	71	319	314	119
Link Distance (ft)	186	186	186	186	459	459	459	459		247	247	247
Upstream Blk Time (%)			0							31	33	
Queuing Penalty (veh)			0							164	175	
Storage Bay Dist (ft)									50			
Storage Blk Time (%)									5	53		
Queuing Penalty (veh)									39	21		

Intersection: 3: Route 99 & Lynde Street

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	321	310
Average Queue (ft)	226	229
95th Queue (ft)	401	395
Link Distance (ft)	278	278
Upstream Blk Time (%)	22	23
Queuing Penalty (veh)	118	123
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Route 99 & Thorndike Street

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	518	528
Average Queue (ft)	282	288
95th Queue (ft)	698	703
Link Distance (ft)	544	544
Upstream Blk Time (%)	9	10
Queuing Penalty (veh)	74	81
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Route 99 & Beacham Street

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	49	49	678	159	332	355	149	682	679
Average Queue (ft)	23	28	533	34	143	145	61	322	314
95th Queue (ft)	54	54	858	104	261	281	146	723	716
Link Distance (ft)	34	34	722		544	544		716	716
Upstream Blk Time (%)	6	22	24					4	3
Queuing Penalty (veh)	0	0	92					27	24
Storage Bay Dist (ft)				175			125		
Storage Blk Time (%)					4		0	28	
Queuing Penalty (veh)					1		0	19	

Intersection: 8: Route 99 & Bowdoin Street

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	121	93	100	104	220	225
Average Queue (ft)	59	35	19	22	135	104
95th Queue (ft)	114	73	68	71	257	229
Link Distance (ft)	107		716	716	202	202
Upstream Blk Time (%)	4				10	7
Queuing Penalty (veh)	0				0	0
Storage Bay Dist (ft)		125				
Storage Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			

Intersection: 11:

Movement	EB	NB	NB	SB	SB	B119
Directions Served	L	LT	T	T	TR	T
Maximum Queue (ft)	157	56	86	102	142	17
Average Queue (ft)	62	19	39	44	79	1
95th Queue (ft)	116	47	71	84	128	10
Link Distance (ft)	406	382	382	22	22	186
Upstream Blk Time (%)				9	19	
Queuing Penalty (veh)				17	37	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 51: Route 99 & Driveway/Dexter Street

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	T	TR	LT	T
Maximum Queue (ft)	224	764	777	536	519
Average Queue (ft)	169	668	749	327	316
95th Queue (ft)	240	985	768	617	578
Link Distance (ft)	196	728	728	459	459
Upstream Blk Time (%)	12	13	59	11	17
Queuing Penalty (veh)	0	0	0	100	153
Storage Bay Dist (ft)					
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			

Zone Summary

Zone wide Queuing Penalty: 1267

VISSIM Output

Lower Broadway Analysis 01-28-15	Build Mitigated VISSIM Analysis				Build Mitigated Synchro Analysis			
Movement	Observed Vehicles	Average Delay (sec)	LOS	Average Queue (ft)	Observed Vehicles	Average Delay (sec)	LOS	Average Queue (ft)
Dexter Street/Alford Street (Route 99)	**3998**	**11.9**	**B**	-	-	**17.0**	**B**	-
Dexter WB left	241	31.8	C	43.08	245	58.0	E	164
Dexter WB right	10	26.0	C	43.08	14			
Alford NB thru	1736	11.0	B	76.2	1991	17.5	B	588
Alford NB thru to left-turn lane	247	10.2	B	76.2				
Alford NB right	81	11.0	B	76.2	77			
Alford SB thru	1113	8.2	A	56.8	1811	10.2	B	197
Alford SB right	570	13.9	B	56.8	8			
Beacham Street/Broadway (Route 99)	**3476**	**17.9**	**B**	-	-	**325.5**	**F**	-
Beacham EB left	31	35.8	D	5.6	36	33.1	C	22
Beacham EB thru	5	36.2	D	5.6	2			
Beacham EB right	45	8.3	A	0.4	48	32.2	C	0
Beacham WB left	273	69.8	E	137.4	277	213.5	F	291
Beacham WB thru	19	72.2	E	137.4	17			
Beacham WB right	37	74.6	E	137.4	43			
Broadway NB left	36	23.3	C	1.5	36	623.1	F	957
Broadway NB thru	1628	13.2	B	87.0	1588			
Broadway NB right	14	14.2	B	87.0	15			
Broadway SB left	59	24.5	C	36.2	66	32.2	C	265
Broadway SB thru	1294	10.0	A	36.2	1351			
Broadway SB right	35	10.3	B	36.2	36			
Bowdoin Street/Broadway (Route 99)	**3182**	**12.9**	**B**	-	-	**22.2**	**C**	-
Bowdoin EB left	42	56.3	E	24.9	50	51.0	D	37
Bowdoin EB right	44	58.4	E	24.9	45			
Broadway NB far left	7	11.5	B	0.0	77	34.6	C	372
Broadway NB left	75	22.1	C	128.6				
Broadway NB thru	1620	19.0	B	128.6	1589			
Broadway SB thru	1342	2.6	A	6.8	1404	6.4	A	124
Broadway SB right	52	2.9	A	6.8	53			
Proposed Site Driveway/Mystic Street/Broadway (Route 99)	**3982**	**15.2**	**B**	-	-	**19.7**	**B**	-
Site Driveway EB left	117	32.8	C	12.3	110	59.1	E	48
Site Driveway EB right	264	21.7	C	18.2	278	47.0	D	114
Broadway NB left	248	39.0	D	32.3	245	66.8	E	113
Broadway NB thru	1552	10.1	B	58.8	1549	6.8	A	64
Broadway NB right	21	11.8	B	58.8	211			
Broadway NB right to Bow St	171	11.0	B	58.8				
Broadway SB left	33	44.3	D	7.1	39	68.9	E	29
Broadway SB thru	1420	14.2	B	56.4	1541	19.1	B	337
Broadway SB right	155	10.4	B	7.4	151	9.9	A	0

B.3 Santilli Circle, Everett

- a. Synchro Output
  - a. Existing (2013) Conditions
  - b. No Build (2023) Conditions
  - c. Build (2023) Conditions
  - d. Build (2023) Mitigated Conditions
- b. VISSIM Output
  - a. Existing (2013) Conditions
  - b. Build (2023) Mitigated Conditions

Synchro Output

Existing (2013) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1719	0	0	1514	237	0	1196	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5031			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5031			4988				
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	0	1829	0	0	1611	252	0	1329	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1829	0	0	1863	0	0	1329	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3081			1184				
v/s Ratio Prot		0.36			c0.37			c0.27				
v/s Ratio Perm												
v/c Ratio		0.59			0.60			1.12				
Uniform Delay, d1		9.4			9.5			30.5				
Progression Factor		0.43			1.00			1.00				
Incremental Delay, d2		0.7			0.3			66.6				
Delay (s)		4.7			9.9			97.1				
Level of Service		A			A			F				
Approach Delay (s)		4.7			9.9			97.1			0.0	
Approach LOS		A			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1719	680	0	1514	0	0	0	0	0	405	1052
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	1791	708	0	1646	0	0	0	0	0	418	1085
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1791	672	0	1646	0	0	0	0	0	418	1085
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		53.2	53.2		53.2						14.8	68.0
Effective Green, g (s)		53.2	53.2		53.2						14.8	68.0
Actuated g/C Ratio		0.67	0.67		0.67						0.19	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3348	1013		3381						661	1553
v/s Ratio Prot		0.36			0.32						0.12	c0.46
v/s Ratio Perm			0.44									0.23
v/c Ratio		0.53	0.66		0.49						0.63	0.70
Uniform Delay, d1		7.0	8.0		6.6						30.1	2.2
Progression Factor		1.00	1.00		0.49						1.00	1.00
Incremental Delay, d2		0.6	3.4		0.1						2.0	1.4
Delay (s)		7.6	11.5		3.3						32.1	3.6
Level of Service		A	B		A						C	A
Approach Delay (s)		8.7			3.3			0.0			11.5	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	133	172	91	284	228	195	266	253	252
Average Queue (ft)	76	59	26	184	141	94	234	225	183
95th Queue (ft)	121	125	70	251	220	161	251	252	279
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							49	27	14
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	266	212	138	318	128	119	95	206	204	251
Average Queue (ft)	174	123	52	136	78	64	24	132	103	220
95th Queue (ft)	244	192	111	254	118	109	63	201	224	243
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)				0				2	3	80
Queuing Penalty (veh)				0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1114	0	0	1351	273	0	1232	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.97			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5014			5136				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5014			5136				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	0	1211	0	0	1453	294	0	1270	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1211	0	0	1747	0	0	1270	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	1%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3071			1219				
v/s Ratio Prot		0.24			c0.35			c0.25				
v/s Ratio Perm												
v/c Ratio		0.39			0.57			1.04				
Uniform Delay, d1		7.9			9.2			30.5				
Progression Factor		0.51			1.00			1.00				
Incremental Delay, d2		0.4			0.2			37.4				
Delay (s)		4.4			9.5			67.9				
Level of Service		A			A			E				
Approach Delay (s)		4.4			9.5			67.9			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1114	397	0	1351	0	0	0	0	0	457	990
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5085	1568		5136						3610	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5085	1568		5136						3610	1553
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	1160	414	0	1468	0	0	0	0	0	486	1053
RTOR Reduction (vph)	0	0	25	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1160	389	0	1468	0	0	0	0	0	486	1053
Heavy Vehicles (%)	0%	2%	3%	0%	1%	0%	2%	2%	2%	0%	0%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		52.0	52.0		52.0						16.0	68.0
Effective Green, g (s)		52.0	52.0		52.0						16.0	68.0
Actuated g/C Ratio		0.65	0.65		0.65						0.20	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3305	1019		3338						722	1553
v/s Ratio Prot		0.23			0.29						0.13	c0.44
v/s Ratio Perm			0.25									0.24
v/c Ratio		0.35	0.38		0.44						0.67	0.68
Uniform Delay, d1		6.3	6.5		6.9						29.6	2.1
Progression Factor		1.00	1.00		0.49						1.00	1.00
Incremental Delay, d2		0.3	1.1		0.1						2.5	1.2
Delay (s)		6.6	7.6		3.5						32.1	3.3
Level of Service		A	A		A						C	A
Approach Delay (s)		6.9			3.5			0.0			12.4	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 123:

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	99	92	51	260	222	186	244	244	233
Average Queue (ft)	53	30	8	174	125	95	229	223	182
95th Queue (ft)	91	74	38	243	206	162	237	249	282
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							47	24	12
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 126:

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	208	180	107	159	125	113	60	206	206	245
Average Queue (ft)	138	86	25	71	67	57	16	152	105	205
95th Queue (ft)	198	163	65	131	107	98	44	215	217	270
Link Distance (ft)	369	369	369	369	432	432	432	190	190	190
Upstream Blk Time (%)								3	2	50
Queuing Penalty (veh)								0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 0

No Build (2023) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1884	0	0	1678	257	0	1480	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5033			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5033			4988				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	0	0	1824	279	0	1609	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	0	0	2103	0	0	1609	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3082			1184				
v/s Ratio Prot		0.40			c0.42			c0.32				
v/s Ratio Perm												
v/c Ratio		0.66			0.68			1.36				
Uniform Delay, d1		10.1			10.3			30.5				
Progression Factor		0.39			1.00			1.00				
Incremental Delay, d2		0.8			0.6			167.1				
Delay (s)		4.8			11.0			197.6				
Level of Service		A			B			F				
Approach Delay (s)		4.8			11.0			197.6			0.0	
Approach LOS		A			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	60.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	128.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1884	821	0	1678	0	0	0	0	0	590	1383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	892	0	1824	0	0	0	0	0	641	1503
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	877	0	1824	0	0	0	0	0	641	1503
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		50.0	50.0		50.0						18.0	68.0
Effective Green, g (s)		50.0	50.0		50.0						18.0	68.0
Actuated g/C Ratio		0.62	0.62		0.62						0.22	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3147	952		3178						804	1553
v/s Ratio Prot		0.41			0.36						0.18	c0.60
v/s Ratio Perm			0.58									0.36
v/c Ratio		0.65	0.92		0.57						0.80	0.97
Uniform Delay, d1		9.5	13.3		8.8						29.3	5.1
Progression Factor		1.00	1.00		0.43						1.00	1.00
Incremental Delay, d2		1.1	15.4		0.2						5.5	15.7
Delay (s)		10.5	28.6		3.9						34.8	20.7
Level of Service		B	C		A						C	C
Approach Delay (s)		16.0			3.9			0.0			24.9	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	128.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	150	131	105	289	252	232	266	265	259
Average Queue (ft)	84	68	35	202	154	113	234	235	234
95th Queue (ft)	127	115	82	267	232	183	250	253	250
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							81	80	80
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	336	247	332	366	149	126	87	205	201	247
Average Queue (ft)	204	141	86	191	91	76	29	135	116	222
95th Queue (ft)	294	229	228	352	135	117	68	205	236	243
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)	0		0	2				2	3	82
Queuing Penalty (veh)	0		0	0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1218	0	0	1465	291	0	1377	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5016			5136				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5016			5136				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	0	0	1592	316	0	1497	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	0	0	1908	0	0	1497	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	1%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3072			1219				
v/s Ratio Prot		0.26			c0.38			c0.29				
v/s Ratio Perm												
v/c Ratio		0.43			0.62			1.23				
Uniform Delay, d1		8.1			9.7			30.5				
Progression Factor		0.48			1.00			1.00				
Incremental Delay, d2		0.4			0.4			110.0				
Delay (s)		4.3			10.1			140.5				
Level of Service		A			B			F				
Approach Delay (s)		4.3			10.1			140.5			0.0	
Approach LOS		A			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1218	489	0	1465	0	0	0	0	0	494	1113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5085	1568		5136						3610	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5085	1568		5136						3610	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	532	0	1592	0	0	0	0	0	537	1210
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	513	0	1592	0	0	0	0	0	537	1210
Heavy Vehicles (%)	0%	2%	3%	0%	1%	0%	2%	2%	2%	0%	0%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		51.3	51.3		51.3						16.7	68.0
Effective Green, g (s)		51.3	51.3		51.3						16.7	68.0
Actuated g/C Ratio		0.64	0.64		0.64						0.21	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3260	1005		3293						753	1553
v/s Ratio Prot		0.26			0.31						0.15	c0.50
v/s Ratio Perm			0.33									0.28
v/c Ratio		0.41	0.51		0.48						0.71	0.78
Uniform Delay, d1		7.0	7.7		7.5						29.4	2.7
Progression Factor		1.00	1.00		0.47						1.00	1.00
Incremental Delay, d2		0.4	1.9		0.1						3.2	2.5
Delay (s)		7.3	9.5		3.6						32.6	5.2
Level of Service		A	A		A						C	A
Approach Delay (s)		8.0			3.6			0.0			13.6	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.2%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 123:

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	107	96	79	294	231	214	254	261	247
Average Queue (ft)	57	40	12	191	141	112	231	230	220
95th Queue (ft)	98	82	45	265	218	192	241	245	270
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							70	61	55
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 126:

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	234	188	85	202	128	124	75	206	207	249
Average Queue (ft)	147	92	26	90	77	67	22	147	123	221
95th Queue (ft)	215	170	61	164	116	110	58	218	237	243
Link Distance (ft)	369	369	369	369	432	432	432	190	190	190
Upstream Blk Time (%)								3	3	76
Queuing Penalty (veh)								0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Build (2023) Conditions

HCM Signalized Intersection Capacity Analysis
10: Mystic View Rd/Santilli Cir. & Route 16

1/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1884	0	0	1678	257	0	1480	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5033			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5033			4988				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	0	0	1824	279	0	1609	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	0	0	2103	0	0	1609	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3082			1184				
v/s Ratio Prot		0.40			c0.42			c0.32				
v/s Ratio Perm												
v/c Ratio		0.66			0.68			1.36				
Uniform Delay, d1		10.1			10.3			30.5				
Progression Factor		0.39			1.00			1.00				
Incremental Delay, d2		0.8			0.6			167.1				
Delay (s)		4.8			11.0			197.6				
Level of Service		A			B			F				
Approach Delay (s)		4.8			11.0			197.6			0.0	
Approach LOS		A			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	60.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1884	944	0	1678	0	0	0	0	0	590	1437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	1026	0	1824	0	0	0	0	0	641	1562
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	1011	0	1824	0	0	0	0	0	641	1562
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		50.0	50.0		50.0						18.0	68.0
Effective Green, g (s)		50.0	50.0		50.0						18.0	68.0
Actuated g/C Ratio		0.62	0.62		0.62						0.22	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3147	952		3178						804	1553
v/s Ratio Prot		0.41			0.36						0.18	c0.63
v/s Ratio Perm			0.66									0.38
v/c Ratio		0.65	1.06		0.57						0.80	1.01
Uniform Delay, d1		9.5	15.0		8.8						29.3	6.0
Progression Factor		1.00	1.00		0.43						1.00	1.00
Incremental Delay, d2		1.1	46.9		0.2						5.5	24.2
Delay (s)		10.5	61.9		3.9						34.8	30.2
Level of Service		B	E		A						C	C
Approach Delay (s)		27.7			3.9			0.0			31.6	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	144	122	110	300	233	213	266	263	264
Average Queue (ft)	85	70	43	203	155	119	233	234	235
95th Queue (ft)	129	116	97	272	224	194	249	251	253
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							80	80	80
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	346	248	384	392	160	150	125	205	209	247
Average Queue (ft)	198	146	160	262	90	79	30	139	115	219
95th Queue (ft)	284	221	390	434	141	133	81	206	239	240
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)	0		3	11				2	3	81
Queuing Penalty (veh)	0		0	0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑↱			↑↑↑				
Volume (vph)	0	1218	0	0	1465	291	0	1537	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5016			5136				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5016			5136				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	0	0	1592	316	0	1671	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	0	0	1908	0	0	1671	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	1%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3072			1219				
v/s Ratio Prot		0.26			c0.38			c0.33				
v/s Ratio Perm												
v/c Ratio		0.43			0.62			1.37				
Uniform Delay, d1		8.1			9.7			30.5				
Progression Factor		0.48			1.00			1.00				
Incremental Delay, d2		0.4			0.4			172.1				
Delay (s)		4.3			10.1			202.6				
Level of Service		A			B			F				
Approach Delay (s)		4.3			10.1			202.6			0.0	
Approach LOS		A			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	74.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1218	649	0	1465	0	0	0	0	0	494	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5085	1568		5136						3610	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5085	1568		5136						3610	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	705	0	1592	0	0	0	0	0	537	1292
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	686	0	1592	0	0	0	0	0	537	1292
Heavy Vehicles (%)	0%	2%	3%	0%	1%	0%	2%	2%	2%	0%	0%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		51.3	51.3		51.3						16.7	68.0
Effective Green, g (s)		51.3	51.3		51.3						16.7	68.0
Actuated g/C Ratio		0.64	0.64		0.64						0.21	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3260	1005		3293						753	1553
v/s Ratio Prot		0.26			0.31						0.15	c0.53
v/s Ratio Perm			0.44									0.30
v/c Ratio		0.41	0.68		0.48						0.71	0.83
Uniform Delay, d1		7.0	9.2		7.5						29.4	3.1
Progression Factor		1.00	1.00		0.47						1.00	1.00
Incremental Delay, d2		0.4	3.8		0.1						3.2	4.0
Delay (s)		7.3	12.9		3.6						32.6	7.0
Level of Service		A	B		A						C	A
Approach Delay (s)		9.3			3.6			0.0			14.6	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 123:

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	132	113	72	262	224	196	248	251	248
Average Queue (ft)	56	36	11	185	132	101	230	230	230
95th Queue (ft)	111	84	49	243	205	166	237	238	239
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							81	81	80
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 126:

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	228	188	112	257	183	165	109	206	207	249
Average Queue (ft)	146	99	28	125	84	69	28	150	126	221
95th Queue (ft)	210	169	71	226	152	135	81	214	244	245
Link Distance (ft)	369	369	369	369	432	432	432	190	190	190
Upstream Blk Time (%)				0				3	3	76
Queuing Penalty (veh)				0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1884	0	0	1678	257	0	1553	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5033			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5033			4988				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	0	0	1824	279	0	1688	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	0	0	2103	0	0	1688	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		49.0			49.0			19.0				
Effective Green, g (s)		49.0			49.0			19.0				
Actuated g/C Ratio		0.61			0.61			0.24				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		3114			3082			1184				
v/s Ratio Prot		0.40			c0.42			c0.34				
v/s Ratio Perm												
v/c Ratio		0.66			0.68			1.43				
Uniform Delay, d1		10.1			10.3			30.5				
Progression Factor		0.39			1.00			1.00				
Incremental Delay, d2		0.8			0.6			196.5				
Delay (s)		4.8			11.0			227.0				
Level of Service		A			B			F				
Approach Delay (s)		4.8			11.0			227.0			0.0	
Approach LOS		A			B			F			A	

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1884	894	0	1678	0	0	0	0	0	590	1417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	972	0	1824	0	0	0	0	0	641	1540
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	957	0	1824	0	0	0	0	0	641	1540
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		50.0	50.0		50.0						18.0	68.0
Effective Green, g (s)		50.0	50.0		50.0						18.0	68.0
Actuated g/C Ratio		0.62	0.62		0.62						0.22	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3147	952		3178						804	1553
v/s Ratio Prot		0.41			0.36						0.18	c0.62
v/s Ratio Perm			0.63									0.37
v/c Ratio		0.65	1.00		0.57						0.80	0.99
Uniform Delay, d1		9.5	15.0		8.8						29.3	5.7
Progression Factor		1.00	1.00		0.43						1.00	1.00
Incremental Delay, d2		1.1	30.4		0.2						5.5	20.8
Delay (s)		10.5	45.4		3.9						34.8	26.5
Level of Service		B	D		A						C	C
Approach Delay (s)		21.7			3.9			0.0			28.9	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	151	141	102	287	243	200	259	263	263
Average Queue (ft)	82	67	38	200	148	109	235	234	233
95th Queue (ft)	127	116	89	266	222	172	251	251	250
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)							81	80	80
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	340	255	376	398	143	144	116	206	213	253
Average Queue (ft)	198	139	124	232	89	75	29	142	123	221
95th Queue (ft)	294	221	334	413	133	126	74	213	244	245
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)	0		3	8				2	4	82
Queuing Penalty (veh)	0		0	0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Build (2023) Mitigated Conditions

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	231	222	190	407	316	230	254	247	238
Average Queue (ft)	158	138	101	293	224	139	232	213	133
95th Queue (ft)	216	199	164	390	304	208	244	263	241
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)				0			32	11	2
Queuing Penalty (veh)				0			0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	292	237	382	400	90	53	34	209	202	253
Average Queue (ft)	182	131	128	249	24	10	5	131	101	220
95th Queue (ft)	266	214	336	428	67	38	21	198	222	243
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)	0		2	7				1	3	85
Queuing Penalty (veh)	0		0	0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1884	0	0	1678	257	0	1480	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5033			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5033			4988				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	0	0	1824	279	0	1609	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	0	0	2102	0	0	1609	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		39.0			39.0			29.0				
Effective Green, g (s)		39.0			39.0			29.0				
Actuated g/C Ratio		0.49			0.49			0.36				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2478			2453			1808				
v/s Ratio Prot		0.40			c0.42			c0.32				
v/s Ratio Perm												
v/c Ratio		0.83			0.86			0.89				
Uniform Delay, d1		17.6			18.0			24.0				
Progression Factor		0.58			1.00			1.00				
Incremental Delay, d2		2.6			3.2			5.8				
Delay (s)		12.8			21.2			29.8				
Level of Service		B			C			C				
Approach Delay (s)		12.8			21.2			29.8			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑						↑↑	↱
Volume (vph)	0	1884	944	0	1678	0	0	0	0	0	590	1437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	1026	0	1824	0	0	0	0	0	641	1562
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	1012	0	1824	0	0	0	0	0	641	1562
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		53.0	53.0		53.0						15.0	68.0
Effective Green, g (s)		53.0	53.0		53.0						15.0	68.0
Actuated g/C Ratio		0.66	0.66		0.66						0.19	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3336	1009		3368						670	1553
v/s Ratio Prot		0.41			0.36						0.18	c0.67
v/s Ratio Perm			0.66									0.34
v/c Ratio		0.61	1.00		0.54						0.96	1.01
Uniform Delay, d1		7.7	13.5		7.1						32.2	6.0
Progression Factor		1.00	1.00		0.00						1.00	1.00
Incremental Delay, d2		0.9	29.1		0.1						24.3	24.2
Delay (s)		8.5	42.6		0.1						56.5	30.2
Level of Service		A	D		A						E	C
Approach Delay (s)		19.9			0.1			0.0			37.9	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.4%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 123:

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	180	167	117	402	327	243	250	233	226
Average Queue (ft)	107	86	38	262	200	132	229	210	123
95th Queue (ft)	176	150	100	356	293	222	239	259	228
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)				0			28	9	1
Queuing Penalty (veh)				0			0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 126:

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	235	189	87	248	89	82	62	203	206	250
Average Queue (ft)	125	76	21	110	19	14	7	142	126	220
95th Queue (ft)	193	150	61	194	72	70	50	207	243	243
Link Distance (ft)	369	369	369	369	432	432	432	190	190	190
Upstream Blk Time (%)								2	3	79
Queuing Penalty (veh)								0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1218	0	0	1465	291	0	1537	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5016			5136				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5016			5136				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	0	0	1592	316	0	1671	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	0	0	1906	0	0	1671	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	1%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		37.0			37.0			31.0				
Effective Green, g (s)		37.0			37.0			31.0				
Actuated g/C Ratio		0.46			0.46			0.39				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2351			2319			1990				
v/s Ratio Prot		0.26			c0.38			c0.33				
v/s Ratio Perm												
v/c Ratio		0.56			0.82			0.84				
Uniform Delay, d1		15.6			18.6			22.2				
Progression Factor		0.64			1.00			1.00				
Incremental Delay, d2		0.9			2.5			3.3				
Delay (s)		11.0			21.1			25.5				
Level of Service		B			C			C				
Approach Delay (s)		11.0			21.1			25.5			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1218	649	0	1465	0	0	0	0	0	494	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5085	1568		5136						3610	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5085	1568		5136						3610	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1324	705	0	1592	0	0	0	0	0	537	1292
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1324	691	0	1592	0	0	0	0	0	537	1292
Heavy Vehicles (%)	0%	2%	3%	0%	1%	0%	2%	2%	2%	0%	0%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		53.4	53.4		53.4						14.6	68.0
Effective Green, g (s)		53.4	53.4		53.4						14.6	68.0
Actuated g/C Ratio		0.67	0.67		0.67						0.18	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3394	1046		3428						658	1553
v/s Ratio Prot		0.26			0.31						0.15	c0.56
v/s Ratio Perm			0.44									0.28
v/c Ratio		0.39	0.66		0.46						0.82	0.83
Uniform Delay, d1		6.0	7.9		6.4						31.4	3.1
Progression Factor		1.00	1.00		0.00						1.00	1.00
Incremental Delay, d2		0.3	3.3		0.1						7.7	4.0
Delay (s)		6.3	11.2		0.1						39.1	7.0
Level of Service		A	B		A						D	A
Approach Delay (s)		8.0			0.1			0.0			16.5	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Intersection: 10: Mystic View Rd/Santilli Cir. & Route 16

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	TR	T	T	T
Maximum Queue (ft)	260	241	198	419	350	286	255	253	242
Average Queue (ft)	161	144	103	293	225	153	231	217	145
95th Queue (ft)	224	207	170	393	314	238	244	258	248
Link Distance (ft)	432	432	432	405	405	405	214	214	214
Upstream Blk Time (%)				1	0		31	12	3
Queuing Penalty (veh)				0	0		0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Santilli Cir. & Route 16

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	T	T	R
Maximum Queue (ft)	290	218	370	406	142	115	75	205	203	249
Average Queue (ft)	179	127	97	218	32	20	11	138	114	220
95th Queue (ft)	252	197	270	392	112	92	66	211	239	244
Link Distance (ft)	357	357	357	357	432	432	432	190	190	190
Upstream Blk Time (%)			1	4				2	3	85
Queuing Penalty (veh)			0	0				0	0	0
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↱			↑↑↑				
Volume (vph)	0	1884	0	0	1678	257	0	1553	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		0.91			0.91			0.91				
Frt		1.00			0.98			1.00				
Flt Protected		1.00			1.00			1.00				
Satd. Flow (prot)		5085			5033			4988				
Flt Permitted		1.00			1.00			1.00				
Satd. Flow (perm)		5085			5033			4988				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	0	0	1824	279	0	1688	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	0	0	2102	0	0	1688	0	0	0	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	4%	0%	2%	2%	2%
Turn Type		NA			NA			NA				
Protected Phases		2			6			4				
Permitted Phases												
Actuated Green, G (s)		38.0			38.0			30.0				
Effective Green, g (s)		38.0			38.0			30.0				
Actuated g/C Ratio		0.48			0.48			0.38				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2415			2390			1870				
v/s Ratio Prot		0.40			c0.42			c0.34				
v/s Ratio Perm												
v/c Ratio		0.85			0.88			0.90				
Uniform Delay, d1		18.5			18.9			23.6				
Progression Factor		0.59			1.00			1.00				
Incremental Delay, d2		3.1			4.1			6.5				
Delay (s)		14.0			23.0			30.1				
Level of Service		B			C			C				
Approach Delay (s)		14.0			23.0			30.1			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1884	894	0	1678	0	0	0	0	0	590	1417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0						6.0	6.0
Lane Util. Factor		0.91	1.00		0.91						0.95	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						1.00	1.00
Satd. Flow (prot)		5036	1524		5085						3574	1553
Flt Permitted		1.00	1.00		1.00						1.00	1.00
Satd. Flow (perm)		5036	1524		5085						3574	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2048	972	0	1824	0	0	0	0	0	641	1540
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2048	958	0	1824	0	0	0	0	0	641	1540
Heavy Vehicles (%)	0%	3%	6%	0%	2%	0%	2%	2%	2%	0%	1%	4%
Turn Type		NA	Perm		NA						NA	custom
Protected Phases		2			6!						4	2!
Permitted Phases			2									4
Actuated Green, G (s)		53.0	53.0		53.0						15.0	68.0
Effective Green, g (s)		53.0	53.0		53.0						15.0	68.0
Actuated g/C Ratio		0.66	0.66		0.66						0.19	0.85
Clearance Time (s)		6.0	6.0		6.0						6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		3336	1009		3368						670	1553
v/s Ratio Prot		0.41			0.36						0.18	c0.66
v/s Ratio Perm			0.63									0.33
v/c Ratio		0.61	0.95		0.54						0.96	0.99
Uniform Delay, d1		7.7	12.3		7.1						32.2	5.7
Progression Factor		1.00	1.00		0.00						1.00	1.00
Incremental Delay, d2		0.9	18.5		0.1						24.3	20.8
Delay (s)		8.5	30.8		0.1						56.5	26.5
Level of Service		A	C		A						E	C
Approach Delay (s)		15.7			0.1			0.0			35.3	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

VISSIM Output

Santilli Circle Analysis 01-15-2015	Existing VISSIM Analysis				Build Mitigated VISSIM Analysis				Build Mitigated Synchro Analysis			
Movement	Observed Vehicles	Average Delay	LOS	Average Queue	Observed Vehicles	Average Delay	LOS	Average Queue	Observed Vehicles	Average Delay	LOS	Average Queue
Santilli Circle												
Rt 16 EB to Rt 99 Connector EB	680	16.6	B	35.1	1921	9.7	A	52.3	894	30.8	C	371.0
Rt 16 EB to Santilli Hwy NB												
Rt 16 EB to Mystic View SB	485	5.7	A	2.7	562	4.7	A	0.0	-	-	-	-
Rt 16 EB thru	1741	8.9	A	22.9	1921	9.7	A	52.3	1884	8.5	A	184.0
Rt 99 Connector WB to Rt 16 EB	555	49.4	E	358.6	482	9.0	A	1.3	-	-	-	-
Rt 99 Connector WB to Rt 16 WB									-	-	-	-
Rt 99 Connector WB to Santilli Hwy NB									-	-	-	-
Rt 99 Connector WB to Mystic View SB									-	-	-	-
Rt 16 WB thru	1536	16.3	C	60.6	1676	18.4	B	77.9	1678	23.0	C	330.0
Rt 16 WB to Rt 99 Connector EB	238	20.7	C	59.6	265	21.8	C	77.7	257	23.0	C	330.0
Rt 16 WB to Santilli Hwy NB												
Rt 16 WB to Mystic View SB												
Mystic View NB to Rt 99 Connector EB	696	1.7	A	0.0	416	14.3	B	0.8	-	-	-	-
Mystic View NB to Rt 16 WB									-	-	-	-
Mystic View NB to Santilli Hwy NB									-	-	-	-
Mystic View NB to Rt 16 EB					292	1.9	A	0.8	-	-	-	-
Santilli Hwy SB to Rt 99 Connector EB	53	245.4	F	309.0	84	112.1	F	616.9	-	-	-	-
Santilli Hwy SB to Rt 16 EB									-	-	-	-
Santilli Hwy SB to Mystic View SB									-	-	-	-
Santilli Hwy SB to Rt 16 WB	203	229.3	F	309.0	392	99.5	F	616.9	-	-	-	-

B.4 Sweetser Circle, Everett

a. SIDRA Output
    a. Existing (2013) Conditions
    b. No Build (2023) Conditions
    c. Build (2023) Conditions
    d. Build (2023) Mitigated Conditions
b. VISSIM Output

SIDRA Output

Existing (2013) Conditions

MOVEMENT SUMMARY

Site: Existing 2013_PM

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	177	9.0	0.799	22.0	LOS C	8.4	217.4	0.94	1.24	23.5
8	T	827	2.7	0.799	21.9	LOS C	8.5	218.7	0.94	1.21	23.0
18	R	419	4.0	0.799	21.9	LOS C	8.5	218.7	0.94	1.21	23.1
Approach		1422	3.9	0.799	21.9	LOS C	8.5	218.7	0.94	1.21	23.1
East: Broadway (Route 99)											
1	L	237	4.8	1.061	87.9	LOS F	18.4	477.1	1.00	2.07	12.7
6	T	195	5.0	1.061	87.9	LOS F	18.4	477.1	1.00	2.07	10.9
16	R	74	2.0	1.061	87.9	LOS F	18.4	477.1	1.00	2.07	10.9
Approach		506	4.5	1.061	87.9	LOS F	18.4	477.1	1.00	2.07	11.8
North: Main Street											
7	L	145	0.9	0.559	13.9	LOS B	2.5	62.4	0.60	0.92	26.1
4	T	258	2.0	0.559	13.9	LOS B	2.5	62.4	0.60	0.76	26.5
14	R	156	3.0	0.226	7.9	LOS A	0.7	16.8	0.47	0.63	30.2
Approach		559	2.0	0.559	12.2	LOS B	2.5	62.4	0.56	0.77	27.2
West: Route 16 Frontage Road											
5	L	418	2.0	0.532	10.1	LOS B	3.6	91.3	0.75	0.97	27.4
2	T	207	5.3	0.532	10.1	LOS B	3.6	91.4	0.75	0.88	28.5
12	R	465	2.0	0.532	10.1	LOS B	3.6	91.4	0.75	0.88	28.8
Approach		1091	2.6	0.532	10.1	LOS B	3.6	91.4	0.75	0.92	28.1
All Vehicles		3579	3.3	1.061	26.1	LOS D	18.4	477.1	0.83	1.17	21.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing 2013_PM

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	177	9.0	0.799	22.0	LOS C	3.4	87.4	0.94	1.24	23.5
8	T	827	2.7	0.799	21.9	LOS C	3.4	87.9	0.94	1.21	23.0
18	R	419	4.0	0.799	21.9	LOS C	3.4	87.9	0.94	1.21	23.1
Approach		1422	3.9	0.799	21.9	LOS C	3.4	87.9	0.94	1.21	23.1
East: Broadway (Route 99)											
1	L	237	4.8	1.061	87.9	LOS F	7.4	191.9	1.00	2.07	12.7
6	T	195	5.0	1.061	87.9	LOS F	7.4	191.9	1.00	2.07	10.9
16	R	74	2.0	1.061	87.9	LOS F	7.4	191.9	1.00	2.07	10.9
Approach		506	4.5	1.061	87.9	LOS F	7.4	191.9	1.00	2.07	11.8
North: Main Street											
7	L	145	0.9	0.559	13.9	LOS B	1.0	25.1	0.60	0.92	26.1
4	T	258	2.0	0.559	13.9	LOS B	1.0	25.1	0.60	0.76	26.5
14	R	156	3.0	0.226	7.9	LOS A	0.3	6.8	0.47	0.63	30.2
Approach		559	2.0	0.559	12.2	LOS B	1.0	25.1	0.56	0.77	27.2
West: Route 16 Frontage Road											
5	L	418	2.0	0.532	10.1	LOS B	1.4	36.7	0.75	0.97	27.4
2	T	207	5.3	0.532	10.1	LOS B	1.4	36.8	0.75	0.88	28.5
12	R	465	2.0	0.532	10.1	LOS B	1.4	36.8	0.75	0.88	28.8
Approach		1091	2.6	0.532	10.1	LOS B	1.4	36.8	0.75	0.92	28.1
All Vehicles		3579	3.3	1.061	26.1	LOS D	7.4	191.9	0.83	1.17	21.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	89	7.0	0.452	8.6	LOS A	2.6	67.5	0.70	0.94	28.3
8	T	544	1.8	0.452	8.6	LOS A	2.7	67.6	0.70	0.81	29.7
18	R	301	3.0	0.452	8.6	LOS A	2.7	67.6	0.70	0.81	29.7
Approach		934	2.7	0.452	8.6	LOS A	2.7	67.6	0.70	0.82	29.5
East: Broadway (Route 99)											
1	L	298	1.9	0.840	30.9	LOS D	6.4	161.8	0.82	1.13	21.0
6	T	211	2.0	0.840	30.9	LOS D	6.4	161.8	0.82	1.05	19.9
16	R	61	1.0	0.840	30.9	LOS D	6.4	161.8	0.82	1.05	19.9
Approach		570	1.8	0.840	30.9	LOS D	6.4	161.8	0.82	1.09	20.5
North: Main Street											
7	L	135	0.0	0.573	14.2	LOS B	2.6	66.0	0.61	0.93	26.0
4	T	284	1.0	0.573	14.2	LOS B	2.6	66.0	0.61	0.77	26.4
14	R	157	3.0	0.227	7.9	LOS A	0.7	16.9	0.47	0.63	30.2
Approach		576	1.3	0.573	12.5	LOS B	2.6	66.0	0.57	0.77	27.1
West: Route 16 Frontage Road											
5	L	265	2.0	0.489	9.7	LOS A	3.0	76.4	0.74	0.97	27.6
2	T	205	2.8	0.489	9.7	LOS A	3.0	76.4	0.74	0.87	28.7
12	R	485	1.0	0.498	9.8	LOS A	3.1	79.3	0.75	0.88	29.0
Approach		955	1.7	0.498	9.8	LOS A	3.1	79.3	0.75	0.90	28.5
All Vehicles		3035	1.9	0.840	13.9	LOS B	6.4	161.8	0.71	0.89	26.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Existing 2013_SAT

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	89	7.0	0.452	8.6	LOS A	1.1	27.2	0.70	0.94	28.3
8	T	544	1.8	0.452	8.6	LOS A	1.1	27.2	0.70	0.81	29.7
18	R	301	3.0	0.452	8.6	LOS A	1.1	27.2	0.70	0.81	29.7
Approach		934	2.7	0.452	8.6	LOS A	1.1	27.2	0.70	0.82	29.5
East: Broadway (Route 99)											
1	L	298	1.9	0.840	30.9	LOS D	2.6	65.1	0.82	1.13	21.0
6	T	211	2.0	0.840	30.9	LOS D	2.6	65.1	0.82	1.05	19.9
16	R	61	1.0	0.840	30.9	LOS D	2.6	65.1	0.82	1.05	19.9
Approach		570	1.8	0.840	30.9	LOS D	2.6	65.1	0.82	1.09	20.5
North: Main Street											
7	L	135	0.0	0.573	14.2	LOS B	1.1	26.5	0.61	0.93	26.0
4	T	284	1.0	0.573	14.2	LOS B	1.1	26.5	0.61	0.77	26.4
14	R	157	3.0	0.227	7.9	LOS A	0.3	6.8	0.47	0.63	30.2
Approach		576	1.3	0.573	12.5	LOS B	1.1	26.5	0.57	0.77	27.1
West: Route 16 Frontage Road											
5	L	265	2.0	0.489	9.7	LOS A	1.2	30.7	0.74	0.97	27.6
2	T	205	2.8	0.489	9.7	LOS A	1.2	30.7	0.74	0.87	28.7
12	R	485	1.0	0.498	9.8	LOS A	1.3	31.9	0.75	0.88	29.0
Approach		955	1.7	0.498	9.8	LOS A	1.3	31.9	0.75	0.90	28.5
All Vehicles		3035	1.9	0.840	13.9	LOS B	2.6	65.1	0.71	0.89	26.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

No Build (2023) Conditions

MOVEMENT SUMMARY

Site: No Build 2023_PM

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	227	9.0	1.037	64.6	LOS F	28.7	742.6	1.00	2.24	15.2
8	T	955	2.7	1.037	64.5	LOS F	29.0	744.8	1.00	2.24	13.4
18	R	466	4.0	1.037	64.3	LOS F	29.0	744.8	1.00	2.23	13.5
Approach		1648	4.0	1.037	64.4	LOS F	29.0	744.8	1.00	2.24	13.7
East: Broadway (Route 99)											
1	L	296	4.9	1.403	220.1	LOS F	61.5	1593.4	1.00	4.21	6.7
6	T	235	5.0	1.403	220.1	LOS F	61.5	1593.4	1.00	4.21	5.3
16	R	79	2.0	1.403	220.1	LOS F	61.5	1593.4	1.00	4.21	5.3
Approach		609	4.5	1.403	220.1	LOS F	61.5	1593.4	1.00	4.21	6.0
North: Main Street											
7	L	155	0.9	0.627	16.3	LOS C	3.1	77.9	0.64	0.95	25.2
4	T	292	2.0	0.627	16.3	LOS C	3.1	77.9	0.64	0.81	25.4
14	R	170	3.0	0.250	8.3	LOS A	0.7	18.9	0.48	0.64	29.9
Approach		617	2.0	0.627	14.1	LOS B	3.1	77.9	0.60	0.80	26.3
West: Route 16 Frontage Road											
5	L	460	2.0	0.685	14.5	LOS B	6.0	154.9	0.86	1.09	25.7
2	T	287	5.5	0.685	14.5	LOS B	6.1	155.8	0.86	1.03	26.1
12	R	621	2.0	0.685	14.5	LOS B	6.1	155.8	0.86	1.04	26.4
Approach		1368	2.7	0.685	14.5	LOS B	6.1	155.8	0.86	1.05	26.1
All Vehicles		4243	3.4	1.403	63.3	LOS F	61.5	1593.4	0.90	1.93	14.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: No Build 2023_PM

Sweetser Circle
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	227	9.0	1.037	64.6	LOS F	11.5	298.6	1.00	2.24	15.2
8	T	955	2.7	1.037	64.5	LOS F	11.7	299.5	1.00	2.24	13.4
18	R	466	4.0	1.037	64.3	LOS F	11.7	299.5	1.00	2.23	13.5
Approach		1648	4.0	1.037	64.4	LOS F	11.7	299.5	1.00	2.24	13.7
East: Broadway (Route 99)											
1	L	296	4.9	1.403	220.1	LOS F	24.7	640.8	1.00	4.21	6.7
6	T	235	5.0	1.403	220.1	LOS F	24.7	640.8	1.00	4.21	5.3
16	R	79	2.0	1.403	220.1	LOS F	24.7	640.8	1.00	4.21	5.3
Approach		609	4.5	1.403	220.1	LOS F	24.7	640.8	1.00	4.21	6.0
North: Main Street											
7	L	155	0.9	0.627	16.3	LOS C	1.2	31.3	0.64	0.95	25.2
4	T	292	2.0	0.627	16.3	LOS C	1.2	31.3	0.64	0.81	25.4
14	R	170	3.0	0.250	8.3	LOS A	0.3	7.6	0.48	0.64	29.9
Approach		617	2.0	0.627	14.1	LOS B	1.2	31.3	0.60	0.80	26.3
West: Route 16 Frontage Road											
5	L	460	2.0	0.685	14.5	LOS B	2.4	62.3	0.86	1.09	25.7
2	T	287	5.5	0.685	14.5	LOS B	2.5	62.7	0.86	1.03	26.1
12	R	621	2.0	0.685	14.5	LOS B	2.5	62.7	0.86	1.04	26.4
Approach		1368	2.7	0.685	14.5	LOS B	2.5	62.7	0.86	1.05	26.1
All Vehicles		4243	3.4	1.403	63.3	LOS F	24.7	640.8	0.90	1.93	14.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: No Build 2023_SAT

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	128	7.0	0.559	11.1	LOS B	3.8	98.3	0.77	1.02	27.2
8	T	632	1.8	0.559	11.1	LOS B	3.9	98.6	0.78	0.92	28.1
18	R	331	3.0	0.559	11.0	LOS B	3.9	98.6	0.78	0.92	28.2
Approach		1090	2.8	0.559	11.1	LOS B	3.9	98.6	0.78	0.93	28.0
East: Broadway (Route 99)											
1	L	358	1.9	1.052	75.7	LOS F	22.6	572.4	1.00	2.04	13.9
6	T	240	2.0	1.052	75.7	LOS F	22.6	572.4	1.00	2.04	12.1
16	R	64	1.0	1.052	75.7	LOS F	22.6	572.4	1.00	2.04	12.1
Approach		662	1.8	1.052	75.7	LOS F	22.6	572.4	1.00	2.04	13.1
North: Main Street											
7	L	145	0.0	0.677	19.0	LOS C	3.6	89.6	0.70	0.99	24.2
4	T	315	1.0	0.677	19.0	LOS C	3.6	89.6	0.70	0.87	24.1
14	R	172	3.0	0.269	9.0	LOS A	0.8	20.3	0.51	0.66	29.5
Approach		633	1.3	0.677	16.3	LOS C	3.6	89.6	0.65	0.84	25.3
West: Route 16 Frontage Road											
5	L	292	2.0	0.588	12.5	LOS B	4.1	104.5	0.81	1.04	26.5
2	T	235	2.8	0.588	12.5	LOS B	4.1	104.5	0.81	0.96	27.1
12	R	554	1.0	0.611	13.0	LOS B	4.5	113.6	0.83	0.99	27.1
Approach		1081	1.7	0.611	12.8	LOS B	4.5	113.6	0.82	1.00	26.9
All Vehicles		3465	2.0	1.052	24.9	LOS C	22.6	572.4	0.81	1.14	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	128	7.0	0.559	11.1	LOS B	1.5	39.5	0.77	1.02	27.2
8	T	632	1.8	0.559	11.1	LOS B	1.6	39.7	0.78	0.92	28.1
18	R	331	3.0	0.559	11.0	LOS B	1.6	39.7	0.78	0.92	28.2
Approach		1090	2.8	0.559	11.1	LOS B	1.6	39.7	0.78	0.93	28.0
East: Broadway (Route 99)											
1	L	358	1.9	1.052	75.7	LOS F	9.1	230.2	1.00	2.04	13.9
6	T	240	2.0	1.052	75.7	LOS F	9.1	230.2	1.00	2.04	12.1
16	R	64	1.0	1.052	75.7	LOS F	9.1	230.2	1.00	2.04	12.1
Approach		662	1.8	1.052	75.7	LOS F	9.1	230.2	1.00	2.04	13.1
North: Main Street											
7	L	145	0.0	0.677	19.0	LOS C	1.4	36.0	0.70	0.99	24.2
4	T	315	1.0	0.677	19.0	LOS C	1.4	36.0	0.70	0.87	24.1
14	R	172	3.0	0.269	9.0	LOS A	0.3	8.2	0.51	0.66	29.5
Approach		633	1.3	0.677	16.3	LOS C	1.4	36.0	0.65	0.84	25.3
West: Route 16 Frontage Road											
5	L	292	2.0	0.588	12.5	LOS B	1.6	42.0	0.81	1.04	26.5
2	T	235	2.8	0.588	12.5	LOS B	1.6	42.0	0.81	0.96	27.1
12	R	554	1.0	0.611	13.0	LOS B	1.8	45.7	0.83	0.99	27.1
Approach		1081	1.7	0.611	12.8	LOS B	1.8	45.7	0.82	1.00	26.9
All Vehicles		3465	2.0	1.052	24.9	LOS C	9.1	230.2	0.81	1.14	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

Build (2023) Conditions

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	280	5.0	1.126	93.3	LOS F	47.1	1210.4	1.00	3.01	12.3
8	T	964	2.7	1.126	93.3	LOS F	47.1	1210.4	1.00	3.01	10.5
18	R	551	4.0	1.126	93.4	LOS F	47.1	1210.2	1.00	3.01	10.5
Approach		1795	3.5	1.126	93.3	LOS F	47.1	1210.4	1.00	3.01	10.8
East: Broadway (Route 99)											
1	L	306	4.8	1.384	211.3	LOS F	60.0	1554.5	1.00	4.14	6.9
6	T	230	5.0	1.384	211.3	LOS F	60.0	1554.5	1.00	4.14	5.5
16	R	77	2.0	1.384	211.3	LOS F	60.0	1554.5	1.00	4.14	5.5
Approach		613	4.5	1.384	211.3	LOS F	60.0	1554.5	1.00	4.14	6.2
North: Main Street											
7	L	168	0.8	0.671	18.4	LOS C	3.5	89.2	0.68	0.98	24.4
4	T	300	2.0	0.671	18.4	LOS C	3.5	89.2	0.68	0.85	24.4
14	R	167	3.0	0.251	8.5	LOS A	0.7	18.9	0.49	0.65	29.8
Approach		635	1.9	0.671	15.8	LOS C	3.5	89.2	0.63	0.83	25.5
West: Route 16 Frontage Road											
5	L	454	2.0	0.761	18.3	LOS C	7.8	200.0	0.92	1.17	24.5
2	T	281	5.5	0.761	18.3	LOS C	7.8	200.0	0.92	1.14	24.2
12	R	857	1.0	0.867	26.2	LOS D	12.8	321.7	1.00	1.35	21.6
Approach		1592	2.1	0.867	22.5	LOS C	12.8	321.7	0.96	1.26	22.9
All Vehicles		4635	2.9	1.384	74.0	LOS F	60.0	1554.5	0.94	2.26	12.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: Build 2023_PM

Sweetser Circle
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	280	5.0	1.126	93.3	LOS F	18.9	486.8	1.00	3.01	12.3
8	T	964	2.7	1.126	93.3	LOS F	18.9	486.8	1.00	3.01	10.5
18	R	551	4.0	1.126	93.4	LOS F	18.9	486.7	1.00	3.01	10.5
Approach		1795	3.5	1.126	93.3	LOS F	18.9	486.8	1.00	3.01	10.8
East: Broadway (Route 99)											
1	L	306	4.8	1.384	211.3	LOS F	24.1	625.1	1.00	4.14	6.9
6	T	230	5.0	1.384	211.3	LOS F	24.1	625.1	1.00	4.14	5.5
16	R	77	2.0	1.384	211.3	LOS F	24.1	625.1	1.00	4.14	5.5
Approach		613	4.5	1.384	211.3	LOS F	24.1	625.1	1.00	4.14	6.2
North: Main Street											
7	L	168	0.8	0.671	18.4	LOS C	1.4	35.9	0.68	0.98	24.4
4	T	300	2.0	0.671	18.4	LOS C	1.4	35.9	0.68	0.85	24.4
14	R	167	3.0	0.251	8.5	LOS A	0.3	7.6	0.49	0.65	29.8
Approach		635	1.9	0.671	15.8	LOS C	1.4	35.9	0.63	0.83	25.5
West: Route 16 Frontage Road											
5	L	454	2.0	0.761	18.3	LOS C	3.1	80.4	0.92	1.17	24.5
2	T	281	5.5	0.761	18.3	LOS C	3.1	80.4	0.92	1.14	24.2
12	R	857	1.0	0.867	26.2	LOS D	5.1	129.4	1.00	1.35	21.6
Approach		1592	2.1	0.867	22.5	LOS C	5.1	129.4	0.96	1.26	22.9
All Vehicles		4635	2.9	1.384	74.0	LOS F	24.1	625.1	0.94	2.26	12.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Build 2023_SAT

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	197	3.0	0.659	13.8	LOS B	5.5	139.6	0.84	1.08	26.2
8	T	654	1.8	0.659	13.8	LOS B	5.5	139.6	0.84	1.01	26.6
18	R	434	3.0	0.659	13.8	LOS B	5.5	139.1	0.84	1.01	26.7
Approach		1285	2.4	0.659	13.8	LOS B	5.5	139.6	0.84	1.02	26.6
East: Broadway (Route 99)											
1	L	351	1.9	1.094	90.6	LOS F	27.9	707.2	1.00	2.37	12.5
6	T	235	2.0	1.094	90.6	LOS F	27.9	707.2	1.00	2.37	10.7
16	R	66	1.0	1.094	90.6	LOS F	27.9	707.2	1.00	2.37	10.7
Approach		652	1.8	1.094	90.6	LOS F	27.9	707.2	1.00	2.37	11.7
North: Main Street											
7	L	154	0.0	0.727	22.1	LOS C	4.2	104.4	0.73	1.02	23.3
4	T	329	1.0	0.727	22.1	LOS C	4.2	104.4	0.73	0.92	22.9
14	R	169	3.0	0.270	9.2	LOS A	0.8	20.3	0.52	0.67	29.3
Approach		652	1.3	0.727	18.8	LOS C	4.2	104.4	0.68	0.88	24.3
West: Route 16 Frontage Road											
5	L	292	2.0	0.585	12.5	LOS B	4.0	103.1	0.81	1.04	26.6
2	T	230	2.8	0.585	12.5	LOS B	4.0	103.1	0.81	0.96	27.1
12	R	809	0.5	0.890	30.5	LOS D	13.3	334.9	1.00	1.43	20.2
Approach		1331	1.2	0.890	23.4	LOS C	13.3	334.9	0.92	1.26	22.6
All Vehicles		3920	1.7	1.094	30.7	LOS D	27.9	707.2	0.87	1.30	20.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Build 2023_SAT

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	197	3.0	0.659	13.8	LOS B	2.2	56.1	0.84	1.08	26.2
8	T	654	1.8	0.659	13.8	LOS B	2.2	56.1	0.84	1.01	26.6
18	R	434	3.0	0.659	13.8	LOS B	2.2	56.0	0.84	1.01	26.7
Approach		1285	2.4	0.659	13.8	LOS B	2.2	56.1	0.84	1.02	26.6
East: Broadway (Route 99)											
1	L	351	1.9	1.094	90.6	LOS F	11.2	284.4	1.00	2.37	12.5
6	T	235	2.0	1.094	90.6	LOS F	11.2	284.4	1.00	2.37	10.7
16	R	66	1.0	1.094	90.6	LOS F	11.2	284.4	1.00	2.37	10.7
Approach		652	1.8	1.094	90.6	LOS F	11.2	284.4	1.00	2.37	11.7
North: Main Street											
7	L	154	0.0	0.727	22.1	LOS C	1.7	42.0	0.73	1.02	23.3
4	T	329	1.0	0.727	22.1	LOS C	1.7	42.0	0.73	0.92	22.9
14	R	169	3.0	0.270	9.2	LOS A	0.3	8.2	0.52	0.67	29.3
Approach		652	1.3	0.727	18.8	LOS C	1.7	42.0	0.68	0.88	24.3
West: Route 16 Frontage Road											
5	L	292	2.0	0.585	12.5	LOS B	1.6	41.5	0.81	1.04	26.6
2	T	230	2.8	0.585	12.5	LOS B	1.6	41.5	0.81	0.96	27.1
12	R	809	0.5	0.890	30.5	LOS D	5.4	134.7	1.00	1.43	20.2
Approach		1331	1.2	0.890	23.4	LOS C	5.4	134.7	0.92	1.26	22.6
All Vehicles		3920	1.7	1.094	30.7	LOS D	11.2	284.4	0.87	1.30	20.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	260	5.0	1.078	77.1	LOS F	37.1	951.9	1.00	2.59	13.8
8	T	952	2.7	1.078	77.1	LOS F	37.1	951.9	1.00	2.59	12.0
18	R	511	4.0	1.078	77.2	LOS F	37.0	951.7	1.00	2.59	12.0
Approach		1723	3.5	1.078	77.1	LOS F	37.1	951.9	1.00	2.59	12.3
East: Broadway (Route 99)											
1	L	300	4.8	1.380	210.1	LOS F	59.1	1530.7	1.00	4.11	6.9
6	T	230	5.0	1.380	210.1	LOS F	59.1	1530.7	1.00	4.11	5.5
16	R	77	2.0	1.380	210.1	LOS F	59.1	1530.7	1.00	4.11	5.5
Approach		607	4.5	1.380	210.1	LOS F	59.1	1530.7	1.00	4.11	6.2
North: Main Street											
7	L	166	0.8	0.654	17.6	LOS C	3.3	84.7	0.67	0.97	24.7
4	T	294	2.0	0.654	17.6	LOS C	3.3	84.7	0.67	0.84	24.8
14	R	167	3.0	0.249	8.4	LOS A	0.7	18.7	0.49	0.64	29.9
Approach		627	2.0	0.654	15.1	LOS C	3.3	84.7	0.62	0.82	25.9
West: Route 16 Frontage Road											
5	L	454	2.0	0.745	17.3	LOS C	7.4	190.0	0.90	1.15	24.8
2	T	281	5.5	0.745	17.3	LOS C	7.7	193.3	0.90	1.11	24.7
12	R	736	1.0	0.745	17.0	LOS C	7.7	193.3	0.92	1.12	25.1
Approach		1471	2.2	0.745	17.2	LOS C	7.7	193.3	0.91	1.13	24.9
All Vehicles		4428	3.0	1.380	66.7	LOS F	59.1	1530.7	0.92	2.06	13.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	260	5.0	1.078	77.1	LOS F	14.9	382.8	1.00	2.59	13.8
8	T	952	2.7	1.078	77.1	LOS F	14.9	382.8	1.00	2.59	12.0
18	R	511	4.0	1.078	77.2	LOS F	14.9	382.7	1.00	2.59	12.0
Approach		1723	3.5	1.078	77.1	LOS F	14.9	382.8	1.00	2.59	12.3
East: Broadway (Route 99)											
1	L	300	4.8	1.380	210.1	LOS F	23.8	615.6	1.00	4.11	6.9
6	T	230	5.0	1.380	210.1	LOS F	23.8	615.6	1.00	4.11	5.5
16	R	77	2.0	1.380	210.1	LOS F	23.8	615.6	1.00	4.11	5.5
Approach		607	4.5	1.380	210.1	LOS F	23.8	615.6	1.00	4.11	6.2
North: Main Street											
7	L	166	0.8	0.654	17.6	LOS C	1.3	34.1	0.67	0.97	24.7
4	T	294	2.0	0.654	17.6	LOS C	1.3	34.1	0.67	0.84	24.8
14	R	167	3.0	0.249	8.4	LOS A	0.3	7.5	0.49	0.64	29.9
Approach		627	2.0	0.654	15.1	LOS C	1.3	34.1	0.62	0.82	25.9
West: Route 16 Frontage Road											
5	L	454	2.0	0.745	17.3	LOS C	3.0	76.4	0.90	1.15	24.8
2	T	281	5.5	0.745	17.3	LOS C	3.1	77.7	0.90	1.11	24.7
12	R	736	1.0	0.745	17.0	LOS C	3.1	77.7	0.92	1.12	25.1
Approach		1471	2.2	0.745	17.2	LOS C	3.1	77.7	0.91	1.13	24.9
All Vehicles		4428	3.0	1.380	66.7	LOS F	23.8	615.6	0.92	2.06	13.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

Build (2023) Mitigated Conditions

MOVEMENT SUMMARY

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	280	5.0	0.600	11.6	LOS B	3.2	82.4	0.69	0.98	26.9
8	T	964	2.7	0.600	11.5	LOS B	3.2	82.9	0.69	0.85	27.9
18	R	551	4.0	0.352	0.1	X	X	X	X	0.30	36.5
Approach		1795	3.5	0.600	8.0	LOS A	3.2	82.9	0.48	0.70	29.7
East: Broadway (Route 99)											
1	L	306	4.8	0.797	41.5	LOS E	3.9	101.0	0.88	1.15	18.6
6	T	230	5.0	0.742	33.6	LOS D	3.2	83.8	0.85	1.04	19.3
16	R	77	2.0	0.742	33.6	LOS D	3.2	83.8	0.85	1.04	19.3
Approach		613	4.5	0.797	37.5	LOS E	3.9	101.0	0.87	1.10	18.9
North: Main Street											
7	L	166	0.8	0.281	9.9	LOS A	0.9	21.5	0.56	0.82	27.5
4	T	300	2.0	0.770	26.9	LOS D	4.5	113.5	0.77	0.98	21.3
14	R	167	3.0	0.770	26.9	LOS D	4.5	113.5	0.77	0.98	21.3
Approach		633	2.0	0.770	22.4	LOS C	4.5	113.5	0.71	0.94	22.9
West: Route 16 Frontage Road											
5	L	454	2.0	0.818	23.3	LOS C	9.3	237.7	0.96	1.26	23.0
2	T	281	5.5	0.818	23.3	LOS C	9.3	237.7	0.96	1.25	22.3
12	R	857	1.0	0.536	0.1	X	X	X	X	0.30	36.4
Approach		1592	2.1	0.818	10.8	LOS B	9.3	237.7	0.44	0.74	27.9
All Vehicles		4633	2.9	0.818	14.9	LOS B	9.3	237.7	0.55	0.80	26.0

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Build 2023_PM - Mitigated

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	280	5.0	0.600	11.6	LOS B	1.3	33.1	0.69	0.98	26.9
8	T	964	2.7	0.600	11.5	LOS B	1.3	33.3	0.69	0.85	27.9
18	R	551	4.0	0.352	0.1	X	X	X	X	0.30	36.5
Approach		1795	3.5	0.600	8.0	LOS A	1.3	33.3	0.48	0.70	29.7
East: Broadway (Route 99)											
1	L	306	4.8	0.797	41.5	LOS E	1.6	40.6	0.88	1.15	18.6
6	T	230	5.0	0.742	33.6	LOS D	1.3	33.7	0.85	1.04	19.3
16	R	77	2.0	0.742	33.6	LOS D	1.3	33.7	0.85	1.04	19.3
Approach		613	4.5	0.797	37.5	LOS E	1.6	40.6	0.87	1.10	18.9
North: Main Street											
7	L	166	0.8	0.281	9.9	LOS A	0.3	8.7	0.56	0.82	27.5
4	T	300	2.0	0.770	26.9	LOS D	1.8	45.7	0.77	0.98	21.3
14	R	167	3.0	0.770	26.9	LOS D	1.8	45.7	0.77	0.98	21.3
Approach		633	2.0	0.770	22.4	LOS C	1.8	45.7	0.71	0.94	22.9
West: Route 16 Frontage Road											
5	L	454	2.0	0.818	23.3	LOS C	3.7	95.6	0.96	1.26	23.0
2	T	281	5.5	0.818	23.3	LOS C	3.7	95.6	0.96	1.25	22.3
12	R	857	1.0	0.536	0.1	X	X	X	X	0.30	36.4
Approach		1592	2.1	0.818	10.8	LOS B	3.7	95.6	0.44	0.74	27.9
All Vehicles		4633	2.9	0.818	14.9	LOS B	3.7	95.6	0.55	0.80	26.0

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Build 2023_SAT - Mitigated

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	197	3.0	0.358	6.5	LOS A	1.4	34.6	0.52	0.86	29.0
8	T	654	1.8	0.358	6.5	LOS A	1.4	34.7	0.52	0.66	31.1
18	R	434	3.0	0.275	0.0	X	X	X	X	0.30	36.5
Approach		1285	2.4	0.358	4.3	LOS A	1.4	34.7	0.34	0.57	32.2
East: Broadway (Route 99)											
1	L	351	1.9	0.589	17.3	LOS C	2.5	63.2	0.67	0.94	24.7
6	T	235	2.0	0.528	15.8	LOS C	2.1	54.1	0.66	0.82	25.7
16	R	66	1.0	0.528	15.8	LOS C	2.1	54.1	0.66	0.82	25.7
Approach		652	1.8	0.589	16.6	LOS C	2.5	63.2	0.67	0.89	25.1
North: Main Street											
7	L	154	0.0	0.248	9.0	LOS A	0.7	18.5	0.53	0.81	27.9
4	T	329	1.0	0.785	27.1	LOS D	4.9	123.4	0.78	0.99	21.2
14	R	169	3.0	0.785	27.1	LOS D	4.9	123.4	0.78	0.99	21.2
Approach		652	1.3	0.785	22.8	LOS C	4.9	123.4	0.72	0.94	22.8
West: Route 16 Frontage Road											
5	L	292	2.0	0.600	13.1	LOS B	4.2	107.0	0.82	1.05	26.3
2	T	230	2.8	0.600	13.1	LOS B	4.2	107.0	0.82	0.98	26.7
12	R	809	0.5	0.504	0.1	X	X	X	X	0.30	36.4
Approach		1331	1.2	0.600	5.2	LOS A	4.2	107.0	0.32	0.58	31.3
All Vehicles		3920	1.7	0.785	9.7	LOS A	4.9	123.4	0.45	0.69	28.5

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Build 2023_SAT - Mitigated

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	197	3.0	0.358	6.5	LOS A	0.5	13.9	0.52	0.86	29.0
8	T	654	1.8	0.358	6.5	LOS A	0.5	13.9	0.52	0.66	31.1
18	R	434	3.0	0.275	0.0	X	X	X	X	0.30	36.5
Approach		1285	2.4	0.358	4.3	LOS A	0.5	13.9	0.34	0.57	32.2
East: Broadway (Route 99)											
1	L	351	1.9	0.589	17.3	LOS C	1.0	25.4	0.67	0.94	24.7
6	T	235	2.0	0.528	15.8	LOS C	0.9	21.7	0.66	0.82	25.7
16	R	66	1.0	0.528	15.8	LOS C	0.9	21.7	0.66	0.82	25.7
Approach		652	1.8	0.589	16.6	LOS C	1.0	25.4	0.67	0.89	25.1
North: Main Street											
7	L	154	0.0	0.248	9.0	LOS A	0.3	7.4	0.53	0.81	27.9
4	T	329	1.0	0.785	27.1	LOS D	2.0	49.6	0.78	0.99	21.2
14	R	169	3.0	0.785	27.1	LOS D	2.0	49.6	0.78	0.99	21.2
Approach		652	1.3	0.785	22.8	LOS C	2.0	49.6	0.72	0.94	22.8
West: Route 16 Frontage Road											
5	L	292	2.0	0.600	13.1	LOS B	1.7	43.0	0.82	1.05	26.3
2	T	230	2.8	0.600	13.1	LOS B	1.7	43.0	0.82	0.98	26.7
12	R	809	0.5	0.504	0.1	X	X	X	X	0.30	36.4
Approach		1331	1.2	0.600	5.2	LOS A	1.7	43.0	0.32	0.58	31.3
All Vehicles		3920	1.7	0.785	9.7	LOS A	2.0	49.6	0.45	0.69	28.5

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: Build 2023_PM - Real Peak - Mitigated

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	260	5.0	0.585	11.2	LOS B	3.0	78.2	0.68	0.97	27.1
8	T	952	2.7	0.585	11.2	LOS B	3.1	78.7	0.68	0.84	28.1
18	R	511	4.0	0.326	0.1	X	X	X	X	0.30	36.5
Approach		1723	3.5	0.585	7.9	LOS A	3.1	78.7	0.48	0.70	29.8
East: Broadway (Route 99)											
1	L	300	4.8	0.766	37.4	LOS E	3.6	92.4	0.87	1.12	19.4
6	T	230	5.0	0.728	31.9	LOS D	3.1	81.2	0.84	1.02	19.8
16	R	77	2.0	0.728	31.9	LOS D	3.1	81.2	0.84	1.03	19.8
Approach		607	4.5	0.766	34.6	LOS D	3.6	92.4	0.85	1.07	19.6
North: Main Street											
7	L	166	0.8	0.276	9.6	LOS A	0.8	21.0	0.54	0.82	27.6
4	T	294	2.0	0.746	24.7	LOS C	4.2	105.8	0.74	0.94	22.1
14	R	167	3.0	0.746	24.7	LOS C	4.2	105.8	0.74	0.94	22.1
Approach		627	2.0	0.746	20.7	LOS C	4.2	105.8	0.69	0.91	23.6
West: Route 16 Frontage Road											
5	L	454	2.0	0.809	22.4	LOS C	9.0	231.4	0.95	1.25	23.2
2	T	281	5.5	0.809	22.4	LOS C	9.0	231.4	0.95	1.23	22.6
12	R	736	1.0	0.460	0.1	X	X	X	X	0.30	36.4
Approach		1471	2.2	0.809	11.3	LOS B	9.0	231.4	0.48	0.77	27.6
All Vehicles		4428	3.0	0.809	14.5	LOS B	9.0	231.4	0.56	0.80	26.1

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: Build 2023_PM - Real Peak - Mitigated

Sweetser Circle
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	50% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Broadway (Route 99)											
3	L	260	5.0	0.585	11.2	LOS B	1.2	31.5	0.68	0.97	27.1
8	T	952	2.7	0.585	11.2	LOS B	1.2	31.7	0.68	0.84	28.1
18	R	511	4.0	0.326	0.1	X	X	X	X	0.30	36.5
Approach		1723	3.5	0.585	7.9	LOS A	1.2	31.7	0.48	0.70	29.8
East: Broadway (Route 99)											
1	L	300	4.8	0.766	37.4	LOS E	1.4	37.1	0.87	1.12	19.4
6	T	230	5.0	0.728	31.9	LOS D	1.3	32.6	0.84	1.02	19.8
16	R	77	2.0	0.728	31.9	LOS D	1.3	32.6	0.84	1.03	19.8
Approach		607	4.5	0.766	34.6	LOS D	1.4	37.1	0.85	1.07	19.6
North: Main Street											
7	L	166	0.8	0.276	9.6	LOS A	0.3	8.4	0.54	0.82	27.6
4	T	294	2.0	0.746	24.7	LOS C	1.7	42.5	0.74	0.94	22.1
14	R	167	3.0	0.746	24.7	LOS C	1.7	42.5	0.74	0.94	22.1
Approach		627	2.0	0.746	20.7	LOS C	1.7	42.5	0.69	0.91	23.6
West: Route 16 Frontage Road											
5	L	454	2.0	0.809	22.4	LOS C	3.6	93.0	0.95	1.25	23.2
2	T	281	5.5	0.809	22.4	LOS C	3.6	93.0	0.95	1.23	22.6
12	R	736	1.0	0.460	0.1	X	X	X	X	0.30	36.4
Approach		1471	2.2	0.809	11.3	LOS B	3.6	93.0	0.48	0.77	27.6
All Vehicles		4428	3.0	0.809	14.5	LOS B	3.6	93.0	0.56	0.80	26.1

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

B.5 Revere Beach Parkway (Route 16), Chelsea

a. Synchro Output
   a. Existing (2013) Conditions
   b. No Build (2023) Conditions
   c. Build (2023) Conditions
   d. Build (2023) Mitigated Conditions

Synchro Output

Existing (2013) Conditions

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1809	1398	164	113	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.88	0.88
Adj. Flow (vph)	0	1846	1427	167	128	8
RTOR Reduction (vph)	0	0	0	30	0	7
Lane Group Flow (vph)	0	1846	1427	137	128	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		90.0	90.0	90.0	9.0	9.0
Effective Green, g (s)		90.0	90.0	90.0	9.0	9.0
Actuated g/C Ratio		0.82	0.82	0.82	0.08	0.08
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		4202	4061	1264	286	132
v/s Ratio Prot		c0.36	0.29		c0.04	
v/s Ratio Perm				0.09		0.00
v/c Ratio		0.44	0.35	0.11	0.45	0.00
Uniform Delay, d1		2.8	2.6	2.0	48.1	46.4
Progression Factor		1.00	0.53	0.33	1.00	1.00
Incremental Delay, d2		0.3	0.2	0.1	0.4	0.0
Delay (s)		3.2	1.5	0.8	48.5	46.4
Level of Service		A	A	A	D	D
Approach Delay (s)		3.2	1.4		48.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	255	1419	201	31	80	1284	48	78	173	36	49	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	10	10	10	16	16
Total Lost time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95			1.00
Frt	1.00	0.98			1.00	0.99			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.99
Satd. Flow (prot)	1624	4698			1805	5110			3117			2035
Flt Permitted	0.95	1.00			0.95	1.00			0.70			0.85
Satd. Flow (perm)	1624	4698			1805	5110			2196			1746
Peak-hour factor, PHF	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90
Adj. Flow (vph)	266	1478	209	33	86	1381	52	83	184	38	54	181
RTOR Reduction (vph)	0	15	0	0	0	3	0	0	0	0	0	0
Lane Group Flow (vph)	266	1672	0	0	119	1430	0	0	305	0	0	235
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	22.5	48.5			11.4	37.4			28.5			28.5
Effective Green, g (s)	22.5	48.5			11.4	37.4			28.5			28.5
Actuated g/C Ratio	0.20	0.44			0.10	0.34			0.26			0.26
Clearance Time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Vehicle Extension (s)	2.0	4.0			2.0	4.0			2.0			2.0
Lane Grp Cap (vph)	332	2071			187	1737			568			452
v/s Ratio Prot	c0.16	c0.36			0.07	0.28						
v/s Ratio Perm									c0.14			0.13
v/c Ratio	0.80	0.81			0.64	0.82			0.54			0.52
Uniform Delay, d1	41.6	26.7			47.3	33.3			35.1			34.9
Progression Factor	0.90	0.95			1.00	1.00			1.00			1.00
Incremental Delay, d2	11.4	3.2			5.1	4.6			0.5			0.4
Delay (s)	49.1	28.5			52.4	37.8			35.6			35.3
Level of Service	D	C			D	D			D			D
Approach Delay (s)		31.3				38.9			35.6			34.5
Approach LOS		C				D			D			C

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	146
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	162
RTOR Reduction (vph)	0
Lane Group Flow (vph)	162
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	28.5
Effective Green, g (s)	28.5
Actuated g/C Ratio	0.26
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	474
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.34
Uniform Delay, d1	33.1
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	33.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1295	230	196	121	1607	9	198	284	169	164	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4859			1685	5010		2025	2005		2006	2027
Flt Permitted		1.00			0.95	1.00		0.11	1.00		0.15	1.00
Satd. Flow (perm)		4859			1685	5010		242	2005		314	2027
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.96	0.89	0.89	0.89	0.90	0.90
Adj. Flow (vph)	0	1321	235	204	126	1674	9	222	319	190	182	214
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	11	0	0	12
Lane Group Flow (vph)	0	1543	0	0	330	1683	0	222	498	0	182	339
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1776			279	2828		191	599		62	404
v/s Ratio Prot		c0.32			c0.20	0.34		c0.08	0.25			0.17
v/s Ratio Perm								0.27			c0.58	
v/c Ratio		0.87			1.18	0.59		1.16	0.83		2.94	0.84
Uniform Delay, d1		44.8			63.3	21.7		46.4	49.6		60.8	58.4
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		5.0			112.7	0.4		115.7	12.0		913.0	17.5
Delay (s)		49.8			176.0	22.1		162.1	61.6		973.7	75.9
Level of Service		D			F	C		F	E		F	E
Approach Delay (s)		49.8				47.3			92.1			382.5
Approach LOS		D				D			F			F

Intersection Summary			
HCM 2000 Control Delay	91.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	123
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	137
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	WB	WB	WB	WB	SE	SE	B43
Directions Served	T	T	T	T	T	T	T	R	L	L	T
Maximum Queue (ft)	221	186	173	26	73	81	109	49	112	77	50
Average Queue (ft)	112	84	75	3	21	24	48	11	65	23	5
95th Queue (ft)	204	166	155	28	59	69	100	37	120	62	31
Link Distance (ft)	186	186	186	670	208	208	208		47	47	152
Upstream Blk Time (%)	2	0	0						31	8	
Queuing Penalty (veh)	0	0	0						0	0	
Storage Bay Dist (ft)								200			
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	LT
Maximum Queue (ft)	111	196	195	213	294	269	276	155	341	374	407	172
Average Queue (ft)	107	184	177	165	217	178	113	74	144	167	185	128
95th Queue (ft)	120	195	215	229	340	285	254	154	306	332	360	185
Link Distance (ft)		112	112	112	208	208	208		822	822	822	146
Upstream Blk Time (%)	37	61	31	24	14	4	2					13
Queuing Penalty (veh)	0	390	200	151	92	23	10					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	44	52						1	11			
Queuing Penalty (veh)	208	134						5	12			

Intersection: 29: Washington Street & Route 16

Movement	NB	SB	SB
Directions Served	TR	LT	R
Maximum Queue (ft)	153	122	100
Average Queue (ft)	54	90	52
95th Queue (ft)	129	126	104
Link Distance (ft)	146	85	85
Upstream Blk Time (%)	1	29	5
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	WB	WB	WB	WB	NB
Directions Served	T	T	TR	T	T	T	T	UL	T	T	TR	L
Maximum Queue (ft)	285	291	290	158	210	245	11	471	471	458	185	615
Average Queue (ft)	224	248	262	18	34	62	0	470	402	82	24	367
95th Queue (ft)	318	328	337	90	125	172	8	480	659	336	117	751
Link Distance (ft)	210	210	210	402	402	402	822	456	456	456	456	593
Upstream Blk Time (%)	17	24	28					81	23	0		14
Queuing Penalty (veh)	89	123	145					0	0	0		0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	T	T
Maximum Queue (ft)	632	121	117	542	522
Average Queue (ft)	540	100	88	475	286
95th Queue (ft)	735	114	157	628	637
Link Distance (ft)	593	38	38	507	507
Upstream Blk Time (%)	49	96	52	58	18
Queuing Penalty (veh)	0	0	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 1581

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1631	1540	182	123	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3467	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3467	1615
Peak-hour factor, PHF	0.97	0.97	0.90	0.90	0.93	0.93
Adj. Flow (vph)	0	1681	1711	202	132	8
RTOR Reduction (vph)	0	0	0	58	0	7
Lane Group Flow (vph)	0	1681	1711	144	132	1
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		43.0	43.0	43.0	6.5	6.5
Effective Green, g (s)		43.0	43.0	43.0	6.5	6.5
Actuated g/C Ratio		0.71	0.71	0.71	0.11	0.11
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		3650	3528	1098	372	173
v/s Ratio Prot		0.33	c0.34		c0.04	
v/s Ratio Perm				0.09		0.00
v/c Ratio		0.46	0.48	0.13	0.35	0.00
Uniform Delay, d1		3.8	3.9	2.8	25.1	24.1
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.5	0.2	0.2	0.0
Delay (s)		4.2	4.3	3.0	25.3	24.1
Level of Service		A	A	A	C	C
Approach Delay (s)		4.2	4.2		25.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↰	↑↑↱			↶	↑↑↱			↰↱		
Volume (vph)	2	200	1377	158	15	62	1433	38	93	136	40	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	9	10	11	9	12	12	11	16	10	16	16
Total Lost time (s)		4.0	5.0			4.0	5.0			5.0		
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		
Frt		1.00	0.98			1.00	1.00			0.98		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1609	4719			1805	5110			3153		
Flt Permitted		0.95	1.00			0.95	1.00			0.66		
Satd. Flow (perm)		1609	4719			1805	5110			2107		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.91	0.91	0.91	0.91	0.95	0.95	0.95	0.94
Adj. Flow (vph)	2	204	1405	161	16	68	1575	42	98	143	42	57
RTOR Reduction (vph)	0	0	8	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	206	1558	0	0	84	1615	0	0	283	0	0
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%	1%	5%	2%	4%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	1	1	6		5	5	2			4		
Permitted Phases									4			8
Actuated Green, G (s)		19.5	61.4			9.9	51.8			23.6		
Effective Green, g (s)		19.5	61.4			9.9	51.8			23.6		
Actuated g/C Ratio		0.17	0.53			0.08	0.44			0.20		
Clearance Time (s)		4.0	5.0			4.0	5.0			5.0		
Vehicle Extension (s)		2.0	4.0			2.0	4.0			2.0		
Lane Grp Cap (vph)		269	2487			153	2272			426		
v/s Ratio Prot		c0.13	0.33			0.05	c0.32					
v/s Ratio Perm										c0.13		
v/c Ratio		0.77	0.63			0.55	0.71			0.66		
Uniform Delay, d1		46.3	19.5			51.2	26.3			42.8		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		11.1	0.6			2.2	1.1			3.0		
Delay (s)		57.4	20.0			53.3	27.4			45.8		
Level of Service		E	C			D	C			D		
Approach Delay (s)			24.4				28.7			45.8		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	116.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	148	134
Ideal Flow (vphpl)	1900	1900
Lane Width	16	16
Total Lost time (s)	5.0	5.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.99	1.00
Satd. Flow (prot)	2064	1812
Flt Permitted	0.77	1.00
Satd. Flow (perm)	1601	1812
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	157	143
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	214	143
Heavy Vehicles (%)	4%	1%
Turn Type	NA	Perm
Protected Phases	8	
Permitted Phases		8
Actuated Green, G (s)	23.6	23.6
Effective Green, g (s)	23.6	23.6
Actuated g/C Ratio	0.20	0.20
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	324	367
v/s Ratio Prot		
v/s Ratio Perm	0.13	0.08
v/c Ratio	0.66	0.39
Uniform Delay, d1	42.8	40.2
Progression Factor	1.00	1.00
Incremental Delay, d2	3.9	0.3
Delay (s)	46.6	40.5
Level of Service	D	D
Approach Delay (s)	44.2	
Approach LOS	D	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↱			↰	↑↑↱		↰	↱		↰	↱
Volume (vph)	0	1236	141	164	140	1841	10	269	216	139	178	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4937			1685	5010		2046	2027		2046	2035
Flt Permitted		1.00			0.95	1.00		0.14	1.00		0.40	1.00
Satd. Flow (perm)		4937			1685	5010		293	2027		851	2035
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.88	0.88
Adj. Flow (vph)	0	1343	153	178	152	2001	11	292	235	151	202	212
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	12	0	0	11
Lane Group Flow (vph)	0	1489	0	0	330	2012	0	292	374	0	202	324
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.1			25.2	85.3		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.1			25.2	85.3		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.36			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1796			280	2822		204	607		170	407
v/s Ratio Prot		c0.30			c0.20	0.40		c0.10	0.18			0.16
v/s Ratio Perm								c0.33			0.24	
v/c Ratio		0.83			1.18	0.71		1.43	0.62		1.19	0.80
Uniform Delay, d1		43.9			63.1	24.1		47.3	45.5		60.6	57.6
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		3.5			111.1	0.9		220.0	4.3		128.7	13.7
Delay (s)		47.3			174.2	25.0		267.2	49.9		189.2	71.3
Level of Service		D			F	C		F	D		F	E
Approach Delay (s)		47.3				46.1			143.5			115.7
Approach LOS		D				D			F			F

Intersection Summary			
HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	151.4	Sum of lost time (s)	25.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	108
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	123
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	WB	WB	WB	WB	B109	B109	SE	SE
Directions Served	T	T	T	T	T	T	T	R	T	T	L	L
Maximum Queue (ft)	231	201	157	39	211	229	236	176	9	16	96	51
Average Queue (ft)	115	86	63	1	71	74	83	33	0	1	49	16
95th Queue (ft)	193	160	121	17	152	170	177	101	6	9	84	44
Link Distance (ft)	186	186	186	670	208	208	208		112	112	47	47
Upstream Blk Time (%)	1	0	0		0	0	0	0			14	1
Queuing Penalty (veh)	0	0	0		1	1	1	0			0	0
Storage Bay Dist (ft)								200				
Storage Blk Time (%)							0	0				
Queuing Penalty (veh)							1	0				

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	B43	B43
Directions Served	R	T	T
Maximum Queue (ft)	11	12	4
Average Queue (ft)	0	0	0
95th Queue (ft)	8	6	3
Link Distance (ft)	47	152	152
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	B113
Directions Served	UL	T	T	TR	T	T	T	UL	T	T	TR	T
Maximum Queue (ft)	111	201	199	192	281	250	205	142	368	363	391	39
Average Queue (ft)	103	180	172	150	141	112	48	50	128	149	168	1
95th Queue (ft)	126	206	217	217	301	255	161	124	296	309	332	27
Link Distance (ft)		112	112	112	208	208	208		822	822	822	210
Upstream Blk Time (%)	26	46	24	15	6	2	0					0
Queuing Penalty (veh)	0	272	138	88	36	9	1					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	32	44						1	8			
Queuing Penalty (veh)	146	88						6	6			

Intersection: 29: Washington Street & Route 16

Movement	B113	NB	NB	SB	SB
Directions Served	T	LT	TR	LT	R
Maximum Queue (ft)	39	182	152	123	100
Average Queue (ft)	1	134	68	92	55
95th Queue (ft)	28	193	148	122	110
Link Distance (ft)	210	146	146	85	85
Upstream Blk Time (%)	0	15	1	33	7
Queuing Penalty (veh)	0	0	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	WB	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	UL	T	T	TR
Maximum Queue (ft)	281	306	285	228	254	261	13	16	471	471	461	374
Average Queue (ft)	221	242	247	33	51	63	1	1	467	425	127	70
95th Queue (ft)	315	331	339	170	200	220	10	12	515	633	409	251
Link Distance (ft)	210	210	210	402	402	402	822	822	456	456	456	456
Upstream Blk Time (%)	18	24	26	0	1	1			75	20	0	0
Queuing Penalty (veh)	87	117	127	1	3	3			0	0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	NB	NB	SB	SB	B63	B63
Directions Served	L	TR	L	TR	T	T
Maximum Queue (ft)	608	608	102	117	494	472
Average Queue (ft)	444	358	100	104	383	286
95th Queue (ft)	727	681	111	154	674	616
Link Distance (ft)	593	593	38	38	507	507
Upstream Blk Time (%)	31	11	91	62	42	18
Queuing Penalty (veh)	0	0	0	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1132

No Build (2023) Conditions

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	2012	1542	186	134	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2187	1676	202	146	8
RTOR Reduction (vph)	0	0	0	37	0	7
Lane Group Flow (vph)	0	2187	1676	165	146	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		89.6	89.6	89.6	9.4	9.4
Effective Green, g (s)		89.6	89.6	89.6	9.4	9.4
Actuated g/C Ratio		0.81	0.81	0.81	0.09	0.09
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		4183	4043	1259	299	138
v/s Ratio Prot		c0.43	0.34		c0.04	
v/s Ratio Perm				0.11		0.00
v/c Ratio		0.52	0.41	0.13	0.49	0.00
Uniform Delay, d1		3.3	2.9	2.1	48.0	46.0
Progression Factor		1.00	0.62	0.23	1.00	1.00
Incremental Delay, d2		0.5	0.1	0.1	0.5	0.0
Delay (s)		3.8	1.9	0.6	48.5	46.0
Level of Service		A	A	A	D	D
Approach Delay (s)		3.8	1.8		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	273	1607	216	33	92	1409	50	82	182	38	80	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	10	10	10	16	16
Total Lost time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95			1.00
Frt	1.00	0.98			1.00	0.99			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.98
Satd. Flow (prot)	1624	4702			1805	5111			3117			2036
Flt Permitted	0.95	1.00			0.95	1.00			0.72			0.78
Satd. Flow (perm)	1624	4702			1805	5111			2264			1616
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	1747	235	36	100	1532	54	89	198	41	87	186
RTOR Reduction (vph)	0	16	0	0	0	4	0	0	0	0	0	0
Lane Group Flow (vph)	297	1966	0	0	136	1582	0	0	328	0	0	273
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	20.8	40.6			9.8	29.6			38.0			38.0
Effective Green, g (s)	20.8	40.6			9.8	29.6			38.0			38.0
Actuated g/C Ratio	0.19	0.37			0.09	0.27			0.35			0.35
Clearance Time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Vehicle Extension (s)	2.0	4.0			2.0	4.0			2.0			2.0
Lane Grp Cap (vph)	307	1735			160	1375			782			558
v/s Ratio Prot	c0.18	c0.42			0.08	0.31						
v/s Ratio Perm									0.14			c0.17
v/c Ratio	0.97	1.13			0.85	1.15			0.42			0.49
Uniform Delay, d1	44.3	34.7			49.4	40.2			27.6			28.4
Progression Factor	0.91	0.95			1.00	1.00			1.00			1.00
Incremental Delay, d2	38.8	66.7			31.1	76.7			0.1			0.2
Delay (s)	79.1	99.7			80.5	116.9			27.7			28.6
Level of Service	E	F			F	F			C			C
Approach Delay (s)		97.0				114.0			27.7			27.7
Approach LOS		F				F			C			C

Intersection Summary			
HCM 2000 Control Delay	91.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	184
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	200
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	38.0
Effective Green, g (s)	38.0
Actuated g/C Ratio	0.35
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	632
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.32
Uniform Delay, d1	26.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	26.6
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1497	252	206	127	1751	9	213	299	183	172	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4864			1685	5010		2025	2003		2006	2028
Flt Permitted		1.00			0.95	1.00		0.11	1.00		0.13	1.00
Satd. Flow (perm)		4864			1685	5010		242	2003		279	2028
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1627	274	224	138	1903	10	232	325	199	187	221
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	11	0	0	12
Lane Group Flow (vph)	0	1889	0	0	362	1913	0	232	513	0	187	349
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1778			279	2828		191	599		55	404
v/s Ratio Prot		c0.39			c0.21	0.38		c0.08	0.26			0.17
v/s Ratio Perm								0.28			c0.67	
v/c Ratio		1.06			1.30	0.68		1.21	0.86		3.40	0.86
Uniform Delay, d1		48.2			63.3	23.3		46.6	50.1		60.8	58.8
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		40.1			157.7	0.7		134.8	14.1		1124.5	20.6
Delay (s)		88.3			221.0	24.0		181.4	64.2		1185.3	79.3
Level of Service		F			F	C		F	E		F	E
Approach Delay (s)		88.3				55.3			100.2			456.7
Approach LOS		F				E			F			F

Intersection Summary			
HCM 2000 Control Delay	113.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	129
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	140
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	B109	B109
Directions Served	T	T	T	T	T	T	T	T	T	R	T	T
Maximum Queue (ft)	291	264	264	638	584	494	78	120	190	117	6	11
Average Queue (ft)	255	231	216	344	287	194	35	47	77	19	0	0
95th Queue (ft)	281	279	285	674	616	516	74	107	150	65	4	8
Link Distance (ft)	186	186	186	670	670	670	208	208	208		112	112
Upstream Blk Time (%)	63	45	37	3	2	2			0	0		
Queuing Penalty (veh)	0	0	0	0	0	0			0	0		
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	SE	SE	B43	B43
Directions Served	L	L	R	T	T
Maximum Queue (ft)	112	105	11	167	163
Average Queue (ft)	102	79	0	139	95
95th Queue (ft)	123	140	8	210	211
Link Distance (ft)	47	47	47	152	152
Upstream Blk Time (%)	96	62	0	68	26
Queuing Penalty (veh)	0	0	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	LT
Maximum Queue (ft)	111	209	199	208	302	302	288	154	422	422	447	184
Average Queue (ft)	108	186	186	189	262	256	242	75	164	185	209	130
95th Queue (ft)	117	196	193	207	313	298	307	160	337	348	382	187
Link Distance (ft)		112	112	112	208	208	208		822	822	822	146
Upstream Blk Time (%)	45	72	49	51	51	32	33					9
Queuing Penalty (veh)	0	518	354	365	364	230	235					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	60	66						2	14			
Queuing Penalty (veh)	319	179						11	18			

Intersection: 29: Washington Street & Route 16

Movement	NB	SB	SB
Directions Served	TR	LT	R
Maximum Queue (ft)	149	128	100
Average Queue (ft)	55	98	57
95th Queue (ft)	133	121	110
Link Distance (ft)	146	85	85
Upstream Blk Time (%)	0	37	7
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	B115	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	T	UL	T	T
Maximum Queue (ft)	303	298	302	335	366	398	69	74	92	471	471	461
Average Queue (ft)	262	272	278	86	116	156	11	12	14	470	381	86
95th Queue (ft)	319	320	314	288	320	359	93	101	112	487	674	361
Link Distance (ft)	210	210	210	402	402	402	822	822	822	456	456	456
Upstream Blk Time (%)	29	36	41	2	3	4				83	17	1
Queuing Penalty (veh)	170	214	242	13	17	22				0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	WB	NB	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	L	TR	T	T
Maximum Queue (ft)	236	604	634	121	117	533	522
Average Queue (ft)	22	340	564	100	97	467	314
95th Queue (ft)	137	709	709	113	155	654	663
Link Distance (ft)	456	593	593	38	38	507	507
Upstream Blk Time (%)	0	13	55	96	60	70	19
Queuing Penalty (veh)	0	0	0	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3270

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑↑	↑↑↑	↱	↰↰	↱
Volume (vph)	0	1762	1656	201	138	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3467	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1915	1800	218	150	8
RTOR Reduction (vph)	0	0	0	63	0	6
Lane Group Flow (vph)	0	1915	1800	155	150	2
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		42.9	42.9	42.9	6.6	6.6
Effective Green, g (s)		42.9	42.9	42.9	6.6	6.6
Actuated g/C Ratio		0.71	0.71	0.71	0.11	0.11
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		3641	3519	1096	378	176
v/s Ratio Prot		c0.37	0.36		c0.04	
v/s Ratio Perm				0.10		0.00
v/c Ratio		0.53	0.51	0.14	0.40	0.01
Uniform Delay, d1		4.1	4.0	2.8	25.1	24.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.5	0.3	0.3	0.0
Delay (s)		4.6	4.6	3.1	25.3	24.0
Level of Service		A	A	A	C	C
Approach Delay (s)		4.6	4.4		25.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	2	210	1503	167	16	65	1552	40	98	143	42	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	9	10	11	9	12	12	11	16	10	16	16
Total Lost time (s)		4.0	5.0			4.0	5.0			5.0		
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		
Frt		1.00	0.98			1.00	1.00			0.98		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1609	4721			1805	5111			3152		
Flt Permitted		0.95	1.00			0.95	1.00			0.63		
Satd. Flow (perm)		1609	4721			1805	5111			2024		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	228	1634	182	17	71	1687	43	107	155	46	63
RTOR Reduction (vph)	0	0	8	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	230	1808	0	0	88	1728	0	0	308	0	0
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%	1%	5%	2%	4%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	1	1	6		5	5	2			4		
Permitted Phases									4			8
Actuated Green, G (s)		20.3	66.0			10.1	55.8			25.3		
Effective Green, g (s)		20.3	66.0			10.1	55.8			25.3		
Actuated g/C Ratio		0.16	0.54			0.08	0.45			0.21		
Clearance Time (s)		4.0	5.0			4.0	5.0			5.0		
Vehicle Extension (s)		2.0	4.0			2.0	4.0			2.0		
Lane Grp Cap (vph)		265	2529			147	2314			415		
v/s Ratio Prot		c0.14	c0.38			0.05	0.34					
v/s Ratio Perm										0.15		
v/c Ratio		0.87	0.71			0.60	0.75			0.74		
Uniform Delay, d1		50.1	21.5			54.6	27.9			45.9		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		23.8	1.1			4.3	1.4			6.2		
Delay (s)		74.0	22.6			58.9	29.3			52.1		
Level of Service		E	C			E	C			D		
Approach Delay (s)			28.4				30.7			52.1		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	156	141
Ideal Flow (vphpl)	1900	1900
Lane Width	16	16
Total Lost time (s)	5.0	5.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.99	1.00
Satd. Flow (prot)	2064	1812
Flt Permitted	0.70	1.00
Satd. Flow (perm)	1468	1812
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	170	153
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	233	153
Heavy Vehicles (%)	4%	1%
Turn Type	NA	Perm
Protected Phases	8	
Permitted Phases		8
Actuated Green, G (s)	25.3	25.3
Effective Green, g (s)	25.3	25.3
Actuated g/C Ratio	0.21	0.21
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	301	372
v/s Ratio Prot		
v/s Ratio Perm	c0.16	0.08
v/c Ratio	0.77	0.41
Uniform Delay, d1	46.2	42.5
Progression Factor	1.00	1.00
Incremental Delay, d2	10.7	0.3
Delay (s)	57.0	42.8
Level of Service	E	D
Approach Delay (s)	51.4	
Approach LOS	D	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1348	155	172	149	1973	11	291	227	161	187	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4937			1685	5010		2046	2019		2046	2035
Flt Permitted		1.00			0.95	1.00		0.13	1.00		0.32	1.00
Satd. Flow (perm)		4937			1685	5010		279	2019		690	2035
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1465	168	187	162	2145	12	316	247	175	203	214
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	13	0	0	11
Lane Group Flow (vph)	0	1626	0	0	349	2157	0	316	409	0	203	327
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1805			279	2828		201	603		137	406
v/s Ratio Prot		c0.33			c0.21	0.43		c0.10	0.20			0.16
v/s Ratio Perm								c0.37			0.29	
v/c Ratio		0.90			1.25	0.76		1.57	0.68		1.48	0.80
Uniform Delay, d1		45.5			63.3	25.3		47.3	46.8		60.8	57.9
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		6.8			139.0	1.3		280.1	6.0		251.6	14.2
Delay (s)		52.3			202.3	26.6		327.3	52.8		312.4	72.1
Level of Service		D			F	C		F	D		F	E
Approach Delay (s)		52.3				51.1			170.3			162.3
Approach LOS		D				D			F			F

Intersection Summary			
HCM 2000 Control Delay	78.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	114
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	124
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	B109	SE
Directions Served	T	T	T	T	T	T	T	T	T	R	T	L
Maximum Queue (ft)	257	218	198	137	69	29	213	254	232	181	19	105
Average Queue (ft)	146	119	93	19	11	2	78	90	93	37	1	51
95th Queue (ft)	246	217	180	120	92	29	170	193	189	113	10	91
Link Distance (ft)	186	186	186	670	670	670	208	208	208		112	47
Upstream Blk Time (%)	7	2	1				0	0	0	0		18
Queuing Penalty (veh)	0	0	0				1	3	1	0		0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									0	0		
Queuing Penalty (veh)									1	0		

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	B43	B43
Directions Served	L	T	T
Maximum Queue (ft)	68	12	4
Average Queue (ft)	18	1	0
95th Queue (ft)	48	8	3
Link Distance (ft)	47	152	152
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	B113
Directions Served	UL	T	T	TR	T	T	T	UL	T	T	TR	T
Maximum Queue (ft)	111	205	207	194	300	267	238	131	374	418	413	54
Average Queue (ft)	106	185	179	164	206	168	95	46	141	167	185	2
95th Queue (ft)	122	196	216	229	338	290	233	115	300	329	343	38
Link Distance (ft)		112	112	112	208	208	208		822	822	822	210
Upstream Blk Time (%)	40	60	27	20	16	4	1					
Queuing Penalty (veh)	0	378	171	129	100	24	8					
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	48	55						0	9			
Queuing Penalty (veh)	241	116						0	7			

Intersection: 29: Washington Street & Route 16

Movement	NB	NB	SB	SB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	176	152	116	108
Average Queue (ft)	142	72	95	54
95th Queue (ft)	190	159	122	110
Link Distance (ft)	146	146	85	85
Upstream Blk Time (%)	23	1	45	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	WB	WB	WB	WB	NB	NB
Directions Served	T	T	TR	T	T	T	UL	T	T	TR	L	TR
Maximum Queue (ft)	281	286	296	196	208	241	471	471	465	370	606	559
Average Queue (ft)	230	249	256	38	59	75	470	394	116	67	493	414
95th Queue (ft)	331	338	349	146	175	207	490	657	389	248	755	738
Link Distance (ft)	210	210	210	402	402	402	456	456	456	456	593	593
Upstream Blk Time (%)	19	25	29	0	0	0	77	16	0	0	51	19
Queuing Penalty (veh)	102	137	155	0	0	1	0	0	0	0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	SB	SB	B63	B63
Directions Served	L	TR	T	T
Maximum Queue (ft)	102	117	520	522
Average Queue (ft)	100	111	388	335
95th Queue (ft)	116	140	673	648
Link Distance (ft)	38	38	507	507
Upstream Blk Time (%)	90	74	38	19
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1576

Build (2023) Conditions

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	2099	1631	186	134	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2282	1773	202	146	8
RTOR Reduction (vph)	0	0	0	37	0	7
Lane Group Flow (vph)	0	2282	1773	165	146	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		89.6	89.6	89.6	9.4	9.4
Effective Green, g (s)		89.6	89.6	89.6	9.4	9.4
Actuated g/C Ratio		0.81	0.81	0.81	0.09	0.09
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		4183	4043	1259	299	138
v/s Ratio Prot		c0.44	0.36		c0.04	
v/s Ratio Perm				0.11		0.00
v/c Ratio		0.55	0.44	0.13	0.49	0.00
Uniform Delay, d1		3.4	2.9	2.1	48.0	46.0
Progression Factor		1.00	0.73	0.18	1.00	1.00
Incremental Delay, d2		0.5	0.1	0.1	0.5	0.0
Delay (s)		3.9	2.3	0.4	48.5	46.0
Level of Service		A	A	A	D	D
Approach Delay (s)		3.9	2.1		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	273	1687	223	33	92	1491	50	89	182	38	80	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	10	10	10	16	16
Total Lost time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95			1.00
Frt	1.00	0.98			1.00	1.00			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.98
Satd. Flow (prot)	1624	4704			1805	5112			3115			2036
Flt Permitted	0.95	1.00			0.95	1.00			0.70			0.78
Satd. Flow (perm)	1624	4704			1805	5112			2222			1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	1834	242	36	100	1621	54	97	198	41	87	186
RTOR Reduction (vph)	0	16	0	0	0	3	0	0	0	0	0	0
Lane Group Flow (vph)	297	2060	0	0	136	1672	0	0	336	0	0	273
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	20.2	40.6			9.2	29.6			38.6			38.6
Effective Green, g (s)	20.2	40.6			9.2	29.6			38.6			38.6
Actuated g/C Ratio	0.18	0.37			0.08	0.27			0.35			0.35
Clearance Time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Vehicle Extension (s)	2.0	4.0			2.0	4.0			2.0			2.0
Lane Grp Cap (vph)	298	1736			150	1375			779			565
v/s Ratio Prot	c0.18	c0.44			0.08	0.33						
v/s Ratio Perm									0.15			c0.17
v/c Ratio	1.00	1.19			0.91	1.22			0.43			0.48
Uniform Delay, d1	44.9	34.7			50.0	40.2			27.3			27.9
Progression Factor	0.91	0.94			1.00	1.00			1.00			1.00
Incremental Delay, d2	47.1	89.4			45.8	104.1			0.1			0.2
Delay (s)	87.9	122.1			95.7	144.3			27.4			28.1
Level of Service	F	F			F	F			C			C
Approach Delay (s)		117.9				140.7			27.4			27.3
Approach LOS		F				F			C			C

Intersection Summary			
HCM 2000 Control Delay	111.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	184
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	200
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	38.6
Effective Green, g (s)	38.6
Actuated g/C Ratio	0.35
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	642
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.31
Uniform Delay, d1	26.0
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	26.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1577	252	206	127	1833	9	213	299	183	172	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4868			1685	5010		2025	2003		2006	2028
Flt Permitted		1.00			0.95	1.00		0.11	1.00		0.13	1.00
Satd. Flow (perm)		4868			1685	5010		242	2003		279	2028
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1714	274	224	138	1992	10	232	325	199	187	221
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	11	0	0	12
Lane Group Flow (vph)	0	1977	0	0	362	2002	0	232	513	0	187	349
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1779			279	2828		191	599		55	404
v/s Ratio Prot		c0.41			c0.21	0.40		c0.08	0.26			0.17
v/s Ratio Perm								0.28			c0.67	
v/c Ratio		1.11			1.30	0.71		1.21	0.86		3.40	0.86
Uniform Delay, d1		48.2			63.3	24.0		46.6	50.1		60.8	58.8
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		58.6			157.7	0.9		134.8	14.1		1124.5	20.6
Delay (s)		106.8			221.0	24.9		181.4	64.2		1185.3	79.3
Level of Service		F			F	C		F	E		F	E
Approach Delay (s)		106.8				54.9			100.2			456.7
Approach LOS		F				D			F			F

Intersection Summary			
HCM 2000 Control Delay	118.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.65		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	129
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	140
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	B109	SE
Directions Served	T	T	T	T	T	T	T	T	T	R	T	L
Maximum Queue (ft)	291	256	262	586	573	477	90	115	157	50	11	112
Average Queue (ft)	253	231	218	431	396	342	38	49	77	15	0	103
95th Queue (ft)	283	277	281	872	867	844	77	102	137	43	7	121
Link Distance (ft)	186	186	186	670	670	670	208	208	208		112	47
Upstream Blk Time (%)	62	46	42	26	21	23						94
Queuing Penalty (veh)	0	0	0	0	0	0						0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	B43	B43	B43
Directions Served	L	T	T	T
Maximum Queue (ft)	105	167	158	4
Average Queue (ft)	70	130	84	0
95th Queue (ft)	134	211	208	3
Link Distance (ft)	47	152	152	152
Upstream Blk Time (%)	55	59	33	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	B113
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	T
Maximum Queue (ft)	111	204	211	212	307	289	293	155	398	402	417	5
Average Queue (ft)	108	186	187	188	256	254	243	73	174	198	213	0
95th Queue (ft)	118	197	196	200	311	296	306	160	347	369	384	4
Link Distance (ft)		112	112	112	208	208	208		822	822	822	210
Upstream Blk Time (%)	43	70	47	49	49	31	31					
Queuing Penalty (veh)	0	524	352	366	362	231	230					
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	60	61						1	15			
Queuing Penalty (veh)	336	167						6	18			

Intersection: 29: Washington Street & Route 16

Movement	NB	NB	SB	SB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	175	148	125	100
Average Queue (ft)	133	57	91	61
95th Queue (ft)	187	135	125	119
Link Distance (ft)	146	146	85	85
Upstream Blk Time (%)	10	0	32	10
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	B115	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	T	UL	T	T
Maximum Queue (ft)	295	306	283	437	480	465	248	306	329	471	471	465
Average Queue (ft)	274	281	281	219	254	287	77	87	94	471	401	122
95th Queue (ft)	307	303	291	504	532	546	370	404	416	476	659	433
Link Distance (ft)	210	210	210	402	402	402	822	822	822	456	456	456
Upstream Blk Time (%)	44	50	54	13	15	18				80	20	1
Queuing Penalty (veh)	270	307	330	81	92	109				0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	WB	NB	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	L	TR	T	T
Maximum Queue (ft)	255	614	636	117	117	542	522
Average Queue (ft)	34	482	609	99	87	473	246
95th Queue (ft)	163	806	641	113	157	655	616
Link Distance (ft)	456	593	593	38	38	507	507
Upstream Blk Time (%)		21	83	97	53	72	14
Queuing Penalty (veh)		0	0	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 3780

HCM Signalized Intersection Capacity Analysis
28: Route 16/Route 16 & Union Street

1/13/2015

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1864	1762	201	138	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3467	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2026	1915	218	150	8
RTOR Reduction (vph)	0	0	0	63	0	4
Lane Group Flow (vph)	0	2026	1915	155	150	4
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		42.9	42.9	42.9	6.6	6.6
Effective Green, g (s)		42.9	42.9	42.9	6.6	6.6
Actuated g/C Ratio		0.71	0.71	0.71	0.11	0.11
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		3641	3519	1096	378	176
v/s Ratio Prot		c0.39	0.39		c0.04	
v/s Ratio Perm				0.10		0.00
v/c Ratio		0.56	0.54	0.14	0.40	0.02
Uniform Delay, d1		4.2	4.2	2.8	25.1	24.1
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.6	0.6	0.3	0.3	0.0
Delay (s)		4.8	4.8	3.1	25.3	24.1
Level of Service		A	A	A	C	C
Approach Delay (s)		4.8	4.6		25.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	2	210	1597	175	16	65	1650	40	107	143	42	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	9	10	11	9	12	12	11	16	10	16	16
Total Lost time (s)		4.0	5.0			4.0	5.0			5.0		
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		
Frt		1.00	0.99			1.00	1.00			0.98		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1609	4722			1805	5113			3152		
Flt Permitted		0.95	1.00			0.95	1.00			0.62		
Satd. Flow (perm)		1609	4722			1805	5113			1994		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	228	1736	190	17	71	1793	43	116	155	46	63
RTOR Reduction (vph)	0	0	7	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	230	1919	0	0	88	1834	0	0	317	0	0
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%	1%	5%	2%	4%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	1	1	6		5	5	2			4		
Permitted Phases									4			8
Actuated Green, G (s)		20.2	68.5			10.2	58.5			25.2		
Effective Green, g (s)		20.2	68.5			10.2	58.5			25.2		
Actuated g/C Ratio		0.16	0.54			0.08	0.47			0.20		
Clearance Time (s)		4.0	5.0			4.0	5.0			5.0		
Vehicle Extension (s)		2.0	4.0			2.0	4.0			2.0		
Lane Grp Cap (vph)		258	2571			146	2377			399		
v/s Ratio Prot		c0.14	c0.41			0.05	0.36					
v/s Ratio Perm										0.16		
v/c Ratio		0.89	0.75			0.60	0.77			0.88dl		
Uniform Delay, d1		51.7	22.0			55.8	28.1			47.8		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		28.9	1.3			4.7	1.7			9.8		
Delay (s)		80.6	23.3			60.6	29.8			57.6		
Level of Service		F	C			E	C			E		
Approach Delay (s)			29.4				31.2			57.6		
Approach LOS			C				C			E		

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	156	141
Ideal Flow (vphpl)	1900	1900
Lane Width	16	16
Total Lost time (s)	5.0	5.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.99	1.00
Satd. Flow (prot)	2064	1812
Flt Permitted	0.67	1.00
Satd. Flow (perm)	1411	1812
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	170	153
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	233	153
Heavy Vehicles (%)	4%	1%
Turn Type	NA	Perm
Protected Phases	8	
Permitted Phases		8
Actuated Green, G (s)	25.2	25.2
Effective Green, g (s)	25.2	25.2
Actuated g/C Ratio	0.20	0.20
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	282	362
v/s Ratio Prot		
v/s Ratio Perm	c0.17	0.08
v/c Ratio	0.83	0.42
Uniform Delay, d1	48.2	43.9
Progression Factor	1.00	1.00
Incremental Delay, d2	16.9	0.3
Delay (s)	65.1	44.2
Level of Service	E	D
Approach Delay (s)	56.8	
Approach LOS	E	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1442	155	172	149	2077	11	291	227	161	187	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.99			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4941			1685	5010		2046	2019		2046	2035
Flt Permitted		1.00			0.95	1.00		0.13	1.00		0.32	1.00
Satd. Flow (perm)		4941			1685	5010		279	2019		690	2035
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1567	168	187	162	2258	12	316	247	175	203	214
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	13	0	0	11
Lane Group Flow (vph)	0	1729	0	0	349	2270	0	316	409	0	203	327
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1806			279	2828		201	603		137	406
v/s Ratio Prot		c0.35			c0.21	0.45		c0.10	0.20			0.16
v/s Ratio Perm								c0.37			0.29	
v/c Ratio		0.96			1.25	0.80		1.57	0.68		1.48	0.80
Uniform Delay, d1		47.0			63.3	26.3		47.3	46.8		60.8	57.9
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		12.5			139.0	1.8		280.1	6.0		251.6	14.2
Delay (s)		59.5			202.3	28.1		327.3	52.8		312.4	72.1
Level of Service		E			F	C		F	D		F	E
Approach Delay (s)		59.5				51.3			170.3			162.3
Approach LOS		E				D			F			F

Intersection Summary			
HCM 2000 Control Delay	80.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	114
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	124
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	B109	B109
Directions Served	T	T	T	T	T	T	T	T	T	R	T	T
Maximum Queue (ft)	258	220	197	149	108	54	249	260	244	206	23	22
Average Queue (ft)	152	124	95	20	10	3	94	105	106	41	1	1
95th Queue (ft)	258	218	182	116	84	40	206	227	216	128	13	16
Link Distance (ft)	186	186	186	670	670	670	208	208	208		112	112
Upstream Blk Time (%)	8	2	1				1	1	1	0		0
Queuing Penalty (veh)	0	0	0				4	5	3	0		0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									1	0		
Queuing Penalty (veh)									1	0		

Intersection: 28: Route 16/Route 16 & Union Street

Movement	B109	SE	SE	B43	B43
Directions Served	T	L	L	T	T
Maximum Queue (ft)	9	112	68	51	6
Average Queue (ft)	0	58	18	4	0
95th Queue (ft)	7	102	48	27	5
Link Distance (ft)	112	47	47	152	152
Upstream Blk Time (%)		22	2		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	UL	T	T	TR	T	T	T	UL	T	T	TR	LT
Maximum Queue (ft)	111	204	204	209	286	273	254	155	444	440	468	171
Average Queue (ft)	105	182	180	170	199	172	108	44	154	169	191	146
95th Queue (ft)	122	206	213	220	344	303	256	118	342	347	372	187
Link Distance (ft)		112	112	112	208	208	208		822	822	822	146
Upstream Blk Time (%)	38	57	29	23	16	5	2					31
Queuing Penalty (veh)	0	380	191	153	107	33	12					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	47	53						0	10			
Queuing Penalty (veh)	253	112						3	8			

Intersection: 29: Washington Street & Route 16

Movement	NB	SB	SB
Directions Served	TR	LT	R
Maximum Queue (ft)	155	123	100
Average Queue (ft)	78	92	49
95th Queue (ft)	161	125	106
Link Distance (ft)	146	85	85
Upstream Blk Time (%)	1	47	7
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	WB	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	UL	T	T	TR
Maximum Queue (ft)	292	286	294	252	303	313	6	35	471	471	466	392
Average Queue (ft)	251	263	269	56	80	108	0	1	471	381	100	64
95th Queue (ft)	324	326	335	189	227	259	6	19	475	670	368	255
Link Distance (ft)	210	210	210	402	402	402	822	822	456	456	456	456
Upstream Blk Time (%)	25	30	34	0	0	0			78	18	1	0
Queuing Penalty (veh)	140	174	197	0	1	2			0	0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	NB	NB	SB	SB	B63	B63
Directions Served	L	TR	L	TR	T	T
Maximum Queue (ft)	608	608	102	117	522	522
Average Queue (ft)	529	477	99	107	405	340
95th Queue (ft)	757	787	110	147	680	676
Link Distance (ft)	593	593	38	38	507	507
Upstream Blk Time (%)	56	31	93	68	50	25
Queuing Penalty (veh)	0	0	0	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 1780

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	2062	1593	186	134	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2241	1732	202	146	8
RTOR Reduction (vph)	0	0	0	37	0	7
Lane Group Flow (vph)	0	2241	1732	165	146	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		89.6	89.6	89.6	9.4	9.4
Effective Green, g (s)		89.6	89.6	89.6	9.4	9.4
Actuated g/C Ratio		0.81	0.81	0.81	0.09	0.09
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		4183	4043	1259	299	138
v/s Ratio Prot		c0.44	0.35		c0.04	
v/s Ratio Perm				0.11		0.00
v/c Ratio		0.54	0.43	0.13	0.49	0.00
Uniform Delay, d1		3.4	2.9	2.1	48.0	46.0
Progression Factor		1.00	0.68	0.20	1.00	1.00
Incremental Delay, d2		0.5	0.1	0.1	0.5	0.0
Delay (s)		3.9	2.1	0.5	48.5	46.0
Level of Service		A	A	A	D	D
Approach Delay (s)		3.9	1.9		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	273	1653	220	33	92	1456	50	86	182	38	80	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	10	10	10	16	16
Total Lost time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95			1.00
Frt	1.00	0.98			1.00	1.00			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.98
Satd. Flow (prot)	1624	4703			1805	5112			3116			2036
Flt Permitted	0.95	1.00			0.95	1.00			0.71			0.78
Satd. Flow (perm)	1624	4703			1805	5112			2242			1613
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	1797	239	36	100	1583	54	93	198	41	87	186
RTOR Reduction (vph)	0	16	0	0	0	4	0	0	0	0	0	0
Lane Group Flow (vph)	297	2020	0	0	136	1633	0	0	332	0	0	273
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	20.5	40.6			9.5	29.6			38.3			38.3
Effective Green, g (s)	20.5	40.6			9.5	29.6			38.3			38.3
Actuated g/C Ratio	0.19	0.37			0.09	0.27			0.35			0.35
Clearance Time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Vehicle Extension (s)	2.0	4.0			2.0	4.0			2.0			2.0
Lane Grp Cap (vph)	302	1735			155	1375			780			561
v/s Ratio Prot	c0.18	c0.43			0.08	0.32						
v/s Ratio Perm									0.15			c0.17
v/c Ratio	0.98	1.16			0.88	1.19			0.43			0.49
Uniform Delay, d1	44.6	34.7			49.7	40.2			27.4			28.1
Progression Factor	0.91	0.95			1.00	1.00			1.00			1.00
Incremental Delay, d2	43.4	79.9			37.8	92.1			0.1			0.2
Delay (s)	83.9	112.7			87.5	132.3			27.6			28.4
Level of Service	F	F			F	F			C			C
Approach Delay (s)		109.1				128.9			27.6			27.5
Approach LOS		F				F			C			C

Intersection Summary			
HCM 2000 Control Delay	102.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	184
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	200
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	38.3
Effective Green, g (s)	38.3
Actuated g/C Ratio	0.35
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	637
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.31
Uniform Delay, d1	26.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	26.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1543	252	206	127	1798	9	213	299	183	172	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4867			1685	5010		2025	2003		2006	2028
Flt Permitted		1.00			0.95	1.00		0.11	1.00		0.13	1.00
Satd. Flow (perm)		4867			1685	5010		242	2003		279	2028
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1677	274	224	138	1954	10	232	325	199	187	221
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	11	0	0	12
Lane Group Flow (vph)	0	1940	0	0	362	1964	0	232	513	0	187	349
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		Perm	NA
Protected Phases		2		1	1	6		7	4			8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Effective Green, g (s)		55.5			25.2	85.7		45.4	45.4		30.3	30.3
Actuated g/C Ratio		0.37			0.17	0.56		0.30	0.30		0.20	0.20
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		6.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		8.0	8.0
Lane Grp Cap (vph)		1779			279	2828		191	599		55	404
v/s Ratio Prot		c0.40			c0.21	0.39		c0.08	0.26			0.17
v/s Ratio Perm								0.28			c0.67	
v/c Ratio		1.09			1.30	0.69		1.21	0.86		3.40	0.86
Uniform Delay, d1		48.2			63.3	23.7		46.6	50.1		60.8	58.8
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		50.5			157.7	0.8		134.8	14.1		1124.5	20.6
Delay (s)		98.6			221.0	24.5		181.4	64.2		1185.3	79.3
Level of Service		F			F	C		F	E		F	E
Approach Delay (s)		98.6				55.1			100.2			456.7
Approach LOS		F				E			F			F

Intersection Summary			
HCM 2000 Control Delay	115.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.64		
Actuated Cycle Length (s)	151.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	129
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	140
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	SE	SE
Directions Served	T	T	T	T	T	T	T	T	T	R	L	L
Maximum Queue (ft)	282	268	260	674	662	633	95	131	161	55	112	105
Average Queue (ft)	254	240	228	518	484	421	39	49	80	18	104	85
95th Queue (ft)	272	275	286	875	870	854	77	111	145	46	116	140
Link Distance (ft)	186	186	186	670	670	670	208	208	208		47	47
Upstream Blk Time (%)	72	60	55	28	20	24					99	73
Queuing Penalty (veh)	0	0	0	0	0	0					0	0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									0			
Queuing Penalty (veh)									0			

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	B43	B43	B43
Directions Served	R	T	T	T
Maximum Queue (ft)	11	167	167	6
Average Queue (ft)	0	147	91	0
95th Queue (ft)	8	198	208	4
Link Distance (ft)	47	152	152	152
Upstream Blk Time (%)		78	29	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	LT
Maximum Queue (ft)	111	207	206	203	293	304	292	155	399	427	431	171
Average Queue (ft)	107	186	186	187	257	256	243	79	173	197	215	132
95th Queue (ft)	118	194	205	205	308	299	313	163	348	374	382	185
Link Distance (ft)		112	112	112	208	208	208		822	822	822	146
Upstream Blk Time (%)	42	72	49	52	52	38	36					12
Queuing Penalty (veh)	0	531	360	380	380	280	263					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	54	63						2	15			
Queuing Penalty (veh)	300	171						11	18			

Intersection: 29: Washington Street & Route 16

Movement	NB	SB	SB
Directions Served	TR	LT	R
Maximum Queue (ft)	165	136	100
Average Queue (ft)	55	95	61
95th Queue (ft)	137	133	113
Link Distance (ft)	146	85	85
Upstream Blk Time (%)	1	36	8
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	B115	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	T	UL	T	T
Maximum Queue (ft)	293	310	298	425	453	463	15	41	64	472	471	459
Average Queue (ft)	267	276	277	125	159	197	0	2	3	470	389	74
95th Queue (ft)	319	316	315	329	374	412	10	30	38	486	664	316
Link Distance (ft)	210	210	210	402	402	402	822	822	822	456	456	456
Upstream Blk Time (%)	34	40	45	1	1	3				83	18	0
Queuing Penalty (veh)	206	238	270	5	8	16				0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	WB	NB	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	L	TR	T	T
Maximum Queue (ft)	191	608	619	124	117	535	522
Average Queue (ft)	23	373	537	101	95	482	339
95th Queue (ft)	105	731	734	117	154	643	690
Link Distance (ft)	456	593	593	38	38	507	507
Upstream Blk Time (%)		11	47	96	60	71	25
Queuing Penalty (veh)		0	0	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 3437

Build (2023) Mitigated Conditions

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	2099	1631	186	134	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2282	1773	202	146	8
RTOR Reduction (vph)	0	0	0	37	0	7
Lane Group Flow (vph)	0	2282	1773	165	146	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		89.6	89.6	89.6	9.4	9.4
Effective Green, g (s)		89.6	89.6	89.6	9.4	9.4
Actuated g/C Ratio		0.81	0.81	0.81	0.09	0.09
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		4183	4043	1259	299	138
v/s Ratio Prot		c0.44	0.36		c0.04	
v/s Ratio Perm				0.11		0.00
v/c Ratio		0.55	0.44	0.13	0.49	0.00
Uniform Delay, d1		3.4	2.9	2.1	48.0	46.0
Progression Factor		1.00	0.41	0.06	1.00	1.00
Incremental Delay, d2		0.5	0.2	0.1	0.5	0.0
Delay (s)		3.9	1.4	0.2	48.5	46.0
Level of Service		A	A	A	D	D
Approach Delay (s)		3.9	1.3		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	273	1687	223	33	92	1491	50	89	182	38	80	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	10	10	10	16	16
Total Lost time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Lane Util. Factor	1.00	0.91			1.00	0.91			0.95			1.00
Frt	1.00	0.98			1.00	1.00			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.98
Satd. Flow (prot)	1624	4704			1805	5112			3115			2036
Flt Permitted	0.95	1.00			0.95	1.00			0.68			0.75
Satd. Flow (perm)	1624	4704			1805	5112			2141			1545
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	1834	242	36	100	1621	54	97	198	41	87	186
RTOR Reduction (vph)	0	14	0	0	0	3	0	0	0	0	0	0
Lane Group Flow (vph)	297	2062	0	0	136	1672	0	0	336	0	0	273
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	17.0	46.1			8.0	37.1			34.3			34.3
Effective Green, g (s)	17.0	46.1			8.0	37.1			34.3			34.3
Actuated g/C Ratio	0.15	0.42			0.07	0.34			0.31			0.31
Clearance Time (s)	4.0	5.0			4.0	5.0			5.0			5.0
Vehicle Extension (s)	2.0	4.0			2.0	4.0			2.0			2.0
Lane Grp Cap (vph)	250	1971			131	1724			667			481
v/s Ratio Prot	c0.18	c0.44			0.08	0.33						
v/s Ratio Perm									0.16			c0.18
v/c Ratio	1.19	1.05			1.04	0.97			0.50			0.57
Uniform Delay, d1	46.5	31.9			51.0	35.9			30.9			31.6
Progression Factor	0.95	0.89			1.00	1.00			1.00			1.00
Incremental Delay, d2	113.6	32.2			89.2	15.6			0.2			0.9
Delay (s)	157.7	60.7			140.2	51.5			31.1			32.6
Level of Service	F	E			F	D			C			C
Approach Delay (s)		72.8				58.2			31.1			31.2
Approach LOS		E				E			C			C

Intersection Summary			
HCM 2000 Control Delay	60.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	184
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	200
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	34.3
Effective Green, g (s)	34.3
Actuated g/C Ratio	0.31
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	570
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.35
Uniform Delay, d1	29.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	29.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1577	252	206	127	1833	9	213	299	183	172	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		5.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4868			1685	5010		2025	2003		2006	2028
Flt Permitted		1.00			0.95	1.00		0.12	1.00		0.14	1.00
Satd. Flow (perm)		4868			1685	5010		249	2003		288	2028
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1714	274	224	138	1992	10	232	325	199	187	221
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	11	0	0	11
Lane Group Flow (vph)	0	1977	0	0	362	2002	0	232	513	0	187	350
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA
Protected Phases		2		1	1	6		7	4		3	8
Permitted Phases								4			8	
Actuated Green, G (s)		56.5			29.2	90.7		48.4	34.3		38.4	29.3
Effective Green, g (s)		56.5			29.2	90.7		48.4	34.3		38.4	29.3
Actuated g/C Ratio		0.35			0.18	0.57		0.30	0.21		0.24	0.18
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		5.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		3.0	8.0
Lane Grp Cap (vph)		1721			307	2843		232	429		167	371
v/s Ratio Prot		c0.41			c0.21	0.40		c0.09	c0.26		0.06	0.17
v/s Ratio Perm								0.21			0.21	
v/c Ratio		1.15			1.18	0.70		1.00	1.20		1.12	0.94
Uniform Delay, d1		51.7			65.3	24.9		47.6	62.8		56.1	64.4
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		74.2			109.1	0.9		59.1	108.9		105.4	34.2
Delay (s)		125.9			174.4	25.8		106.7	171.6		161.5	98.6
Level of Service		F			F	C		F	F		F	F
Approach Delay (s)		125.9				48.5			151.7			120.1
Approach LOS		F				D			F			F

Intersection Summary			
HCM 2000 Control Delay	96.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	159.8	Sum of lost time (s)	25.0
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	129
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	140
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	B109	B109
Directions Served	T	T	T	T	T	T	T	T	T	R	T	T
Maximum Queue (ft)	267	269	254	443	423	302	200	183	207	123	24	19
Average Queue (ft)	220	193	172	189	152	98	39	38	57	17	1	1
95th Queue (ft)	318	297	288	537	473	373	115	113	137	70	17	14
Link Distance (ft)	186	186	186	670	670	670	208	208	208		112	112
Upstream Blk Time (%)	39	26	19	1	0	0	0	0	0	0	0	0
Queuing Penalty (veh)	0	0	0	0	0	0	1	1	1	0	0	0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		

Intersection: 28: Route 16/Route 16 & Union Street

Movement	B109	SE	SE	SE	B43	B43	B43
Directions Served	T	L	L	R	T	T	T
Maximum Queue (ft)	38	112	105	11	165	157	7
Average Queue (ft)	1	96	69	0	95	70	0
95th Queue (ft)	21	129	135	8	208	190	4
Link Distance (ft)	112	47	47	47	152	152	152
Upstream Blk Time (%)	0	82	59		48	34	
Queuing Penalty (veh)	0	0	0		0	0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	LT
Maximum Queue (ft)	112	209	205	196	297	285	291	155	460	479	502	187
Average Queue (ft)	108	185	186	187	243	243	233	96	218	241	253	131
95th Queue (ft)	122	196	198	202	331	338	347	184	429	445	456	185
Link Distance (ft)		112	112	112	208	208	208		822	822	822	146
Upstream Blk Time (%)	29	66	48	48	37	32	31					11
Queuing Penalty (veh)	0	495	357	360	274	240	231					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	37	60						9	19			
Queuing Penalty (veh)	210	164						43	23			

Intersection: 29: Washington Street & Route 16

Movement	NB	SB	SB
Directions Served	TR	LT	R
Maximum Queue (ft)	144	124	100
Average Queue (ft)	51	93	62
95th Queue (ft)	123	127	116
Link Distance (ft)	146	85	85
Upstream Blk Time (%)	0	32	9
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	B115	B115	WB	WB	WB
Directions Served	T	T	TR	T	T	T	T	T	T	UL	T	T
Maximum Queue (ft)	302	295	298	481	468	485	473	495	494	471	471	465
Average Queue (ft)	273	278	281	262	285	305	139	151	162	468	319	84
95th Queue (ft)	315	307	303	575	578	580	503	534	555	494	649	327
Link Distance (ft)	210	210	210	402	402	402	822	822	822	456	456	456
Upstream Blk Time (%)	46	52	55	22	25	27		0		72	8	0
Queuing Penalty (veh)	283	318	340	138	153	167		0		0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	WB	NB	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	L	TR	T	T
Maximum Queue (ft)	187	612	644	102	117	232	365
Average Queue (ft)	28	472	611	88	111	52	159
95th Queue (ft)	127	808	626	125	137	197	393
Link Distance (ft)	456	593	593	38	38	507	507
Upstream Blk Time (%)		28	90	60	62	0	6
Queuing Penalty (veh)		0	0	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Network Summary

Network wide Queuing Penalty: 3798

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑↑	↑↑↑	↱	↰↰	↱
Volume (vph)	0	1864	1762	201	138	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3467	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2026	1915	218	150	8
RTOR Reduction (vph)	0	0	0	55	0	7
Lane Group Flow (vph)	0	2026	1915	163	150	1
Heavy Vehicles (%)	0%	1%	1%	1%	1%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		58.0	58.0	58.0	8.6	8.6
Effective Green, g (s)		58.0	58.0	58.0	8.6	8.6
Actuated g/C Ratio		0.75	0.75	0.75	0.11	0.11
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		1.0	1.0	1.0	2.0	2.0
Lane Grp Cap (vph)		3838	3710	1155	384	178
v/s Ratio Prot		c0.39	0.39		c0.04	
v/s Ratio Perm				0.11		0.00
v/c Ratio		0.53	0.52	0.14	0.39	0.00
Uniform Delay, d1		4.1	4.0	2.8	32.1	30.7
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.5	0.3	0.2	0.0
Delay (s)		4.6	4.5	3.0	32.3	30.7
Level of Service		A	A	A	C	C
Approach Delay (s)		4.6	4.4		32.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	77.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	2	210	1597	175	16	65	1650	40	107	143	42	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	9	10	11	9	12	12	11	16	10	16	16
Total Lost time (s)		4.0	5.0			4.0	5.0			5.0		
Lane Util. Factor		1.00	0.91			1.00	0.91			0.95		
Frt		1.00	0.99			1.00	1.00			0.98		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1609	4722			1805	5113			3152		
Flt Permitted		0.95	1.00			0.95	1.00			0.63		
Satd. Flow (perm)		1609	4722			1805	5113			2022		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	228	1736	190	17	71	1793	43	116	155	46	63
RTOR Reduction (vph)	0	0	8	0	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	230	1918	0	0	88	1834	0	0	317	0	0
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%	1%	5%	2%	4%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	1	1	6		5	5	2			4		
Permitted Phases									4			8
Actuated Green, G (s)		21.5	67.6			9.2	55.3			26.3		
Effective Green, g (s)		21.5	67.6			9.2	55.3			26.3		
Actuated g/C Ratio		0.17	0.54			0.07	0.44			0.21		
Clearance Time (s)		4.0	5.0			4.0	5.0			5.0		
Vehicle Extension (s)		2.0	4.0			2.0	4.0			2.0		
Lane Grp Cap (vph)		276	2555			132	2263			425		
v/s Ratio Prot		c0.14	0.41			0.05	c0.36					
v/s Ratio Perm										0.16		
v/c Ratio		0.83	0.75			0.67	0.81			0.75		
Uniform Delay, d1		50.0	22.1			56.4	30.2			46.2		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		18.2	1.4			9.4	2.4			6.1		
Delay (s)		68.2	23.5			65.8	32.7			52.3		
Level of Service		E	C			E	C			D		
Approach Delay (s)			28.3				34.2			52.3		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	156	141
Ideal Flow (vphpl)	1900	1900
Lane Width	16	16
Total Lost time (s)	5.0	5.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.99	1.00
Satd. Flow (prot)	2064	1812
Flt Permitted	0.70	1.00
Satd. Flow (perm)	1459	1812
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	170	153
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	233	153
Heavy Vehicles (%)	4%	1%
Turn Type	NA	Perm
Protected Phases	8	
Permitted Phases		8
Actuated Green, G (s)	26.3	26.3
Effective Green, g (s)	26.3	26.3
Actuated g/C Ratio	0.21	0.21
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	307	381
v/s Ratio Prot		
v/s Ratio Perm	c0.16	0.08
v/c Ratio	0.76	0.40
Uniform Delay, d1	46.3	42.5
Progression Factor	1.00	1.00
Incremental Delay, d2	9.2	0.3
Delay (s)	55.5	42.8
Level of Service	E	D
Approach Delay (s)	50.5	
Approach LOS	D	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1442	155	172	149	2077	11	291	227	161	187	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		5.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.99			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4941			1685	5010		2046	2019		2046	2035
Flt Permitted		1.00			0.95	1.00		0.14	1.00		0.17	1.00
Satd. Flow (perm)		4941			1685	5010		305	2019		371	2035
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1567	168	187	162	2258	12	316	247	175	203	214
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	13	0	0	11
Lane Group Flow (vph)	0	1728	0	0	349	2270	0	316	409	0	203	327
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA
Protected Phases		2		1	1	6		7	4		3	8
Permitted Phases								4			8	
Actuated Green, G (s)		55.5			32.2	92.7		46.3	30.2		34.3	23.2
Effective Green, g (s)		55.5			32.2	92.7		46.3	30.2		34.3	23.2
Actuated g/C Ratio		0.35			0.20	0.58		0.29	0.19		0.21	0.15
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		5.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		3.0	8.0
Lane Grp Cap (vph)		1717			339	2908		285	381		196	295
v/s Ratio Prot		c0.35			c0.21	0.45		c0.13	0.20		0.07	0.16
v/s Ratio Perm								c0.19			0.15	
v/c Ratio		1.01			1.03	0.78		1.11	1.07		1.04	1.11
Uniform Delay, d1		52.1			63.7	25.7		49.2	64.8		58.4	68.2
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		23.3			56.7	1.5		85.7	67.1		74.0	84.6
Delay (s)		75.4			120.4	27.2		134.9	131.9		132.4	152.9
Level of Service		E			F	C		F	F		F	F
Approach Delay (s)		75.4				39.6			133.2			145.2
Approach LOS		E				D			F			F

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	159.7	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	114
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	124
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	WB	WB	WB	WB	B109	B109	B109
Directions Served	T	T	T	T	T	T	T	T	R	T	T	T
Maximum Queue (ft)	236	201	162	39	35	259	272	265	182	19	36	23
Average Queue (ft)	134	104	75	5	1	87	92	96	39	1	2	1
95th Queue (ft)	223	185	137	41	22	213	221	215	128	12	16	12
Link Distance (ft)	186	186	186	670	670	208	208	208		112	112	112
Upstream Blk Time (%)	3	0	0			1	1	1	0			
Queuing Penalty (veh)	0	0	0			5	5	4	0			
Storage Bay Dist (ft)									200			
Storage Blk Time (%)								1	0			
Queuing Penalty (veh)								1	0			

Intersection: 28: Route 16/Route 16 & Union Street

Movement	SE	SE	SE	B43
Directions Served	L	L	R	T
Maximum Queue (ft)	112	70	10	61
Average Queue (ft)	63	20	0	4
95th Queue (ft)	113	53	7	27
Link Distance (ft)	47	47	47	152
Upstream Blk Time (%)	27	3		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	B115
Directions Served	UL	T	T	TR	T	T	T	UL	T	T	TR	T
Maximum Queue (ft)	111	204	207	193	289	266	230	154	464	487	500	10
Average Queue (ft)	104	185	185	168	207	171	102	59	206	226	246	0
95th Queue (ft)	123	194	205	225	329	282	234	142	413	433	448	7
Link Distance (ft)		112	112	112	208	208	208		822	822	822	402
Upstream Blk Time (%)	35	59	30	21	13	4	1					
Queuing Penalty (veh)	0	394	199	141	90	25	6					
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	44	51						0	17			
Queuing Penalty (veh)	233	109						1	14			

Intersection: 29: Washington Street & Route 16

Movement	NB	NB	SB	SB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	182	155	125	100
Average Queue (ft)	142	76	94	56
95th Queue (ft)	193	158	123	107
Link Distance (ft)	146	146	85	85
Upstream Blk Time (%)	23	2	40	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	WB	WB	WB	WB	NB	NB
Directions Served	T	T	TR	T	T	T	UL	T	T	TR	L	TR
Maximum Queue (ft)	286	290	294	307	341	367	471	471	464	390	608	608
Average Queue (ft)	259	270	273	103	132	158	437	340	178	117	563	597
95th Queue (ft)	333	327	333	269	308	340	558	623	444	306	737	663
Link Distance (ft)	210	210	210	402	402	402	456	456	456	456	593	593
Upstream Blk Time (%)	32	38	41		0	0	50	7	1	0	47	73
Queuing Penalty (veh)	181	215	233		0	2	0	0	0	0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	SB	SB	B63	B63
Directions Served	L	TR	T	T
Maximum Queue (ft)	102	117	256	489
Average Queue (ft)	89	111	60	221
95th Queue (ft)	125	141	200	488
Link Distance (ft)	38	38	507	507
Upstream Blk Time (%)	61	72	1	3
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1859

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	0	2062	1593	186	134	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	12
Total Lost time (s)		5.0	5.0	5.0	6.0	6.0
Lane Util. Factor		0.91	0.91	1.00	0.97	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		5136	4964	1546	3502	1615
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		5136	4964	1546	3502	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2241	1732	202	146	8
RTOR Reduction (vph)	0	0	0	51	0	7
Lane Group Flow (vph)	0	2241	1732	151	146	1
Heavy Vehicles (%)	0%	1%	1%	1%	0%	0%
Turn Type		NA	NA	Perm	Prot	Perm
Protected Phases		2	2		4	
Permitted Phases				2		4
Actuated Green, G (s)		52.3	52.3	52.3	6.7	6.7
Effective Green, g (s)		52.3	52.3	52.3	6.7	6.7
Actuated g/C Ratio		0.75	0.75	0.75	0.10	0.10
Clearance Time (s)		5.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)		8.0	8.0	8.0	2.0	2.0
Lane Grp Cap (vph)		3837	3708	1155	335	154
v/s Ratio Prot		c0.44	0.35		c0.04	
v/s Ratio Perm				0.10		0.00
v/c Ratio		0.58	0.47	0.13	0.44	0.00
Uniform Delay, d1		4.0	3.4	2.5	29.9	28.6
Progression Factor		1.00	0.36	0.52	1.00	1.00
Incremental Delay, d2		0.7	0.2	0.1	0.3	0.0
Delay (s)		4.6	1.4	1.4	30.2	28.6
Level of Service		A	A	A	C	C
Approach Delay (s)		4.6	1.4		30.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	273	1653	220	33	92	1455	50	86	182	38	80	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	10	11	9	12	12	11	16	16	16	16	16
Total Lost time (s)	5.0	5.0			5.0	5.0			6.0			6.0
Lane Util. Factor	1.00	0.91			1.00	0.91			1.00			1.00
Frt	1.00	0.98			1.00	1.00			0.98			1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99			0.98
Satd. Flow (prot)	1624	4703			1805	5112			1995			2036
Flt Permitted	0.95	1.00			0.95	1.00			0.63			0.71
Satd. Flow (perm)	1624	4703			1805	5112			1277			1466
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	1797	239	36	100	1582	54	93	198	41	87	186
RTOR Reduction (vph)	0	12	0	0	0	3	0	0	0	0	0	0
Lane Group Flow (vph)	297	2024	0	0	136	1633	0	0	332	0	0	273
Heavy Vehicles (%)	0%	1%	2%	0%	0%	1%	0%	6%	5%	0%	0%	6%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			4			8
Permitted Phases								4			8	
Actuated Green, G (s)	25.0	57.0			12.6	44.6			45.6			45.6
Effective Green, g (s)	25.0	57.0			12.6	44.6			45.6			45.6
Actuated g/C Ratio	0.18	0.41			0.09	0.32			0.33			0.33
Clearance Time (s)	5.0	5.0			5.0	5.0			6.0			6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0			3.0
Lane Grp Cap (vph)	290	1914			162	1628			415			477
v/s Ratio Prot	c0.18	c0.43			0.08	0.32						
v/s Ratio Perm									c0.26			0.19
v/c Ratio	1.02	1.06			0.84	1.00			0.80			0.57
Uniform Delay, d1	57.5	41.5			62.7	47.7			43.0			39.1
Progression Factor	1.02	0.92			1.00	1.00			1.00			1.00
Incremental Delay, d2	55.0	36.2			29.9	23.1			10.6			1.7
Delay (s)	113.9	74.6			92.6	70.8			53.6			40.8
Level of Service	F	E			F	E			D			D
Approach Delay (s)		79.6				72.5			53.6			38.8
Approach LOS		E				E			D			D

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	184
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1830
Flt Permitted	1.00
Satd. Flow (perm)	1830
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	200
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	45.6
Effective Green, g (s)	45.6
Actuated g/C Ratio	0.33
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	596
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.34
Uniform Delay, d1	35.7
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	36.1
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	0	1543	252	206	127	1797	9	213	299	183	172	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	9	10	11	9	16	16	16	16	16
Total Lost time (s)		6.0			5.0	6.0		5.0	6.0		4.0	6.0
Lane Util. Factor		0.91			1.00	0.91		1.00	1.00		1.00	1.00
Frt		0.98			1.00	1.00		1.00	0.94		1.00	0.94
Flt Protected		1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		4867			1685	5010		2025	2003		2006	2028
Flt Permitted		1.00			0.95	1.00		0.16	1.00		0.20	1.00
Satd. Flow (perm)		4867			1685	5010		341	2003		422	2028
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1677	274	224	138	1953	10	232	325	199	187	221
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	15	0	0	16
Lane Group Flow (vph)	0	1939	0	0	362	1963	0	232	509	0	187	345
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	1%	1%	2%	2%	0%
Turn Type		NA		Prot	Prot	NA		pm+pt	NA		pm+pt	NA
Protected Phases		2		1	1	6		7	4		3	8
Permitted Phases								4			8	
Actuated Green, G (s)		62.6			25.0	92.6		35.0	25.0		26.0	20.0
Effective Green, g (s)		62.6			25.0	92.6		35.0	25.0		26.0	20.0
Actuated g/C Ratio		0.42			0.17	0.63		0.24	0.17		0.18	0.14
Clearance Time (s)		6.0			5.0	6.0		5.0	6.0		4.0	6.0
Vehicle Extension (s)		4.0			1.0	4.0		1.0	8.0		3.0	8.0
Lane Grp Cap (vph)		2058			284	3134		194	338		138	274
v/s Ratio Prot		c0.40			c0.21	0.39		c0.08	c0.25		0.05	0.17
v/s Ratio Perm								0.20			0.18	
v/c Ratio		0.94			1.27	0.63		1.20	1.51		1.36	1.26
Uniform Delay, d1		41.0			61.5	17.0		52.2	61.5		59.6	64.0
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		10.2			148.1	1.0		127.4	242.6		199.6	143.3
Delay (s)		51.2			209.6	18.0		179.6	304.1		259.2	207.3
Level of Service		D			F	B		F	F		F	F
Approach Delay (s)		51.2				47.8			265.9			225.0
Approach LOS		D				D			F			F

Intersection Summary			
HCM 2000 Control Delay	96.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	129
Ideal Flow (vphpl)	1900
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	140
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 28: Route 16/Route 16 & Union Street

Movement	EB	EB	EB	B31	B31	B31	WB	WB	WB	WB	SE	SE
Directions Served	T	T	T	T	T	T	T	T	T	R	L	L
Maximum Queue (ft)	275	272	273	705	713	712	109	125	146	72	112	105
Average Queue (ft)	255	246	240	657	646	613	32	35	51	15	102	45
95th Queue (ft)	263	268	257	793	811	873	86	96	114	48	138	97
Link Distance (ft)	186	186	186	670	670	670	208	208	208		47	47
Upstream Blk Time (%)	86	67	65	70	50	54		0			85	25
Queuing Penalty (veh)	0	0	0	0	0	0		0			0	0
Storage Bay Dist (ft)										200		
Storage Blk Time (%)									0			
Queuing Penalty (veh)									0			

Intersection: 28: Route 16/Route 16 & Union Street

Movement	B43	B43
Directions Served	T	T
Maximum Queue (ft)	159	154
Average Queue (ft)	74	26
95th Queue (ft)	171	114
Link Distance (ft)	152	152
Upstream Blk Time (%)	10	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Washington Street & Route 16

Movement	EB	EB	EB	EB	B109	B109	B109	WB	WB	WB	WB	NB
Directions Served	L	T	T	TR	T	T	T	UL	T	T	TR	LTR
Maximum Queue (ft)	111	196	202	199	289	301	283	154	414	430	467	187
Average Queue (ft)	109	185	187	188	259	274	270	79	149	169	192	156
95th Queue (ft)	117	189	194	194	309	309	299	165	339	354	381	186
Link Distance (ft)		112	112	112	208	208	208		835	835	835	146
Upstream Blk Time (%)	51	81	51	53	65	39	41					42
Queuing Penalty (veh)	0	591	377	392	479	288	300					0
Storage Bay Dist (ft)	100							130				
Storage Blk Time (%)	68	76						4	12			
Queuing Penalty (veh)	373	206						18	16			

Intersection: 29: Washington Street & Route 16

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	142	105
Average Queue (ft)	101	60
95th Queue (ft)	129	117
Link Distance (ft)	90	90
Upstream Blk Time (%)	45	10
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: Webster Avenue & Route 16

Movement	EB	EB	EB	B113	B113	B113	B115	WB	WB	WB	WB	NB
Directions Served	T	T	TR	T	T	T	T	UL	T	T	TR	L
Maximum Queue (ft)	292	288	290	162	206	223	8	471	471	468	286	615
Average Queue (ft)	207	222	231	36	59	87	0	471	435	136	26	560
95th Queue (ft)	345	359	372	124	172	219	5	476	627	468	155	788
Link Distance (ft)	210	210	210	402	402	402	835	456	456	456	456	593
Upstream Blk Time (%)	16	23	28					82	25	1	0	50
Queuing Penalty (veh)	99	140	167					0	0	0	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 30: Webster Avenue & Route 16

Movement	NB	SB	SB	B63	B63
Directions Served	TR	L	TR	T	T
Maximum Queue (ft)	632	133	117	503	493
Average Queue (ft)	609	99	114	277	311
95th Queue (ft)	622	126	131	605	610
Link Distance (ft)	593	38	38	507	507
Upstream Blk Time (%)	95	83	79	10	24
Queuing Penalty (veh)	0	0	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 3444

B.6 Bell Circle, Revere

- a. Synchro Output
  - a. Existing (2013) Conditions
  - b. No Build (2023) Conditions
  - c. Build (2023) Conditions
  - d. Build (2023) Mitigated Conditions

Synchro Output

Existing (2013) Conditions

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1245	316	1045	809	431
v/c Ratio	0.80	0.42	0.61	0.59	0.60
Control Delay	28.3	14.2	0.1	25.8	19.5
Queue Delay	0.0	0.0	3.5	0.0	0.0
Total Delay	28.3	14.2	3.6	25.8	19.5
Queue Length 50th (ft)	350	98	0	209	141
Queue Length 95th (ft)	452	152	m0	272	244
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1557	751	1715	1362	718
Starvation Cap Reductn	0	0	558	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.80	0.42	0.90	0.59	0.60

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1158	294	0	951	0	0	793	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93	0.92	0.91	0.92	0.92	0.98	0.98
Adj. Flow (vph)	0	0	0	0	1245	316	0	1045	0	0	809	431
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1245	261	0	1045	0	0	809	346
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1557	696		1715			1362	633
v/s Ratio Prot					c0.35	0.16		c0.29			0.24	0.22
v/s Ratio Perm												
v/c Ratio					0.80	0.38		0.61			0.59	0.55
Uniform Delay, d1					24.2	18.8		19.1			23.6	23.0
Progression Factor					0.99	0.96		0.00			1.00	1.00
Incremental Delay, d2					2.7	0.3		0.1			1.9	3.4
Delay (s)					26.6	18.4		0.1			25.5	26.4
Level of Service					C	B		A			C	C
Approach Delay (s)		0.0			24.9			0.1			25.8	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1003	408	1689
v/c Ratio	0.70	0.19	0.67
Control Delay	5.0	0.1	3.7
Queue Delay	0.0	0.3	0.6
Total Delay	5.0	0.4	4.3
Queue Length 50th (ft)	0	0	89
Queue Length 95th (ft)	52	m0	m38
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1439	2138	2523
Starvation Cap Reductn	0	1128	408
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.70	0.40	0.80

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	953	379	1571	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.95	0.93	0.93	0.92	0.92
Adj. Flow (vph)	0	1003	408	1689	0	0
RTOR Reduction (vph)	0	762	212	473	0	0
Lane Group Flow (vph)	0	241	196	1216	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		675	1647	2118		
v/s Ratio Prot		0.09	0.06	c0.39		
v/s Ratio Perm				0.05		
v/c Ratio		0.36	0.12	0.57		
Uniform Delay, d1		31.6	14.3	6.7		
Progression Factor		1.00	1.00	15.63		
Incremental Delay, d2		0.3	0.0	0.2		
Delay (s)		31.9	14.4	104.6		
Level of Service		C	B	F		
Approach Delay (s)	31.9		87.0		0.0	
Approach LOS	C		F		A	

Intersection Summary			
HCM 2000 Control Delay	69.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	NBR	SBR	NEL
Lane Group Flow (vph)	643	856	660	809	1827
v/c Ratio	0.76	0.70	0.48	0.63	1.38
Control Delay	33.8	19.4	16.0	4.3	204.4
Queue Delay	40.5	3.0	0.0	0.1	0.0
Total Delay	74.4	22.3	16.0	4.4	204.4
Queue Length 50th (ft)	176	140	130	50	~801
Queue Length 95th (ft)	243	221	183	56	#937
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	849	1226	1388	1287	1322
Starvation Cap Reductn	249	258	0	43	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.07	0.88	0.48	0.65	1.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	611	813	627	793	951	712
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.94	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	2787	2682	3306	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	2787	2682	3306	
Peak-hour factor, PHF	0.95	0.95	0.95	0.98	0.91	0.91
Adj. Flow (vph)	643	856	660	809	1045	782
RTOR Reduction (vph)	0	0	51	0	0	0
Lane Group Flow (vph)	643	856	609	809	1827	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	849	1226	1337	1287	1322	
v/s Ratio Prot	c0.18	c0.17	0.22	c0.30	c0.55	
v/s Ratio Perm		0.14				
v/c Ratio	0.76	0.70	0.46	0.63	1.38	
Uniform Delay, d1	35.3	25.0	17.3	19.4	30.0	
Progression Factor	0.78	0.70	1.00	0.12	1.00	
Incremental Delay, d2	3.7	1.7	0.2	0.8	176.7	
Delay (s)	31.3	19.2	17.6	3.1	206.7	
Level of Service	C	B	B	A	F	
Approach Delay (s)	24.4				206.7	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	89.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	438	1134	690
v/c Ratio	0.27	0.36	0.44
Control Delay	0.4	0.4	0.6
Queue Delay	0.0	0.7	0.0
Total Delay	0.4	1.1	0.6
Queue Length 50th (ft)	0	7	0
Queue Length 95th (ft)	0	8	0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3114	1583
Starvation Cap Reductn	0	1484	0
Spillback Cap Reductn	98	217	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.29	0.70	0.44

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	403	0	0	1021	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.95	0.92	0.92	0.92	0.90	0.81
Adj. Flow (vph)	0	438	0	0	1134	690
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	438	0	0	1134	690
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3114	1583
v/s Ratio Prot					0.23	
v/s Ratio Perm		0.27			0.09	c0.44
v/c Ratio		0.27			0.36	0.44
Uniform Delay, d1		0.0			2.8	0.0
Progression Factor		1.00			0.18	1.00
Incremental Delay, d2		0.4			0.1	0.6
Delay (s)		0.4			0.6	0.6
Level of Service		A			A	A
Approach Delay (s)	0.4			0.0	0.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1209	363	1030	885	279
v/c Ratio	0.78	0.48	0.61	0.63	0.39
Control Delay	26.3	14.5	0.1	26.6	11.9
Queue Delay	0.0	0.0	2.9	0.0	0.0
Total Delay	26.3	14.5	3.1	26.6	11.9
Queue Length 50th (ft)	341	107	0	233	56
Queue Length 95th (ft)	438	m152	m0	300	122
Internal Link Dist (ft)	37		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1542	751	1698	1402	712
Starvation Cap Reductn	0	0	536	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	0.48	0.89	0.63	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1136	341	0	906	0	0	850	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3505	1583		3539			3505	1568
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3505	1583		3539			3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.92	0.96	0.96
Adj. Flow (vph)	0	0	0	0	1209	363	0	1030	0	0	885	279
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1209	308	0	1030	0	0	885	194
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	0%	2%	0%	0%	3%	3%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1542	696		1698			1402	627
v/s Ratio Prot					c0.34	0.19		c0.29			c0.25	0.12
v/s Ratio Perm												
v/c Ratio					0.78	0.44		0.61			0.63	0.31
Uniform Delay, d1					23.9	19.5		19.1			24.1	20.5
Progression Factor					0.93	0.87		0.00			1.00	1.00
Incremental Delay, d2					2.4	0.4		0.1			2.2	1.3
Delay (s)					24.7	17.3		0.1			26.2	21.8
Level of Service					C	B		A			C	C
Approach Delay (s)		0.0			23.0			0.1			25.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1146	403	1301
v/c Ratio	0.79	0.20	0.53
Control Delay	9.3	0.1	2.4
Queue Delay	0.0	0.3	0.4
Total Delay	9.3	0.4	2.9
Queue Length 50th (ft)	39	0	43
Queue Length 95th (ft)	122	m0	m30
Internal Link Dist (ft)		168	
Turn Bay Length (ft)			
Base Capacity (vph)	1450	2032	2450
Starvation Cap Reductn	0	1046	593
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.79	0.41	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1066	383	1236	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2842	3213	2814		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2842	3213	2814		
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.92	0.92
Adj. Flow (vph)	0	1146	403	1301	0	0
RTOR Reduction (vph)	0	768	210	364	0	0
Lane Group Flow (vph)	0	378	193	937	0	0
Heavy Vehicles (%)	0%	0%	9%	1%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		682	1542	2138		
v/s Ratio Prot		c0.13	0.06	c0.30		
v/s Ratio Perm				0.04		
v/c Ratio		0.55	0.13	0.44		
Uniform Delay, d1		33.3	14.4	5.7		
Progression Factor		1.00	1.00	9.82		
Incremental Delay, d2		1.0	0.0	0.1		
Delay (s)		34.3	14.4	56.3		
Level of Service		C	B	E		
Approach Delay (s)	34.3		46.4		0.0	
Approach LOS	C		D		A	

Intersection Summary			
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	NBR	SBR	NEL
Lane Group Flow (vph)	489	989	644	885	1759
v/c Ratio	0.57	0.81	0.46	0.67	1.35
Control Delay	24.9	19.8	14.3	4.8	188.8
Queue Delay	4.9	4.9	0.0	0.1	0.0
Total Delay	29.8	24.7	14.3	4.9	188.8
Queue Length 50th (ft)	108	121	113	58	~760
Queue Length 95th (ft)	159	215	157	64	#865
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	857	1214	1400	1324	1307
Starvation Cap Reductn	294	166	0	44	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.94	0.46	0.69	1.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	469	949	567	850	906	583
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.94	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3574	2760	2760	2760	3266	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3574	2760	2760	2760	3266	
Peak-hour factor, PHF	0.96	0.96	0.88	0.96	0.88	0.80
Adj. Flow (vph)	489	989	644	885	1030	729
RTOR Reduction (vph)	0	0	76	0	0	0
Lane Group Flow (vph)	489	989	568	885	1759	0
Heavy Vehicles (%)	1%	3%	3%	3%	2%	4%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	857	1214	1324	1324	1306	
v/s Ratio Prot	0.14	c0.20	0.21	c0.32	c0.54	
v/s Ratio Perm		0.16				
v/c Ratio	0.57	0.81	0.43	0.67	1.35	
Uniform Delay, d1	33.5	26.7	17.0	19.9	30.0	
Progression Factor	0.66	0.55	1.00	0.13	1.00	
Incremental Delay, d2	0.9	4.1	0.2	1.0	161.3	
Delay (s)	22.9	18.9	17.3	3.6	191.3	
Level of Service	C	B	B	A	F	
Approach Delay (s)	20.2				191.3	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	79.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	338	1137	296
v/c Ratio	0.21	0.37	0.19
Control Delay	0.3	0.3	0.2
Queue Delay	0.0	0.5	0.0
Total Delay	0.3	0.9	0.2
Queue Length 50th (ft)	0	4	0
Queue Length 95th (ft)	0	4	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3084	1583
Starvation Cap Reductn	0	1367	0
Spillback Cap Reductn	55	68	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.66	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	304	0	0	1114	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3505	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3505	1583
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.98	0.98
Adj. Flow (vph)	0	338	0	0	1137	296
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	338	0	0	1137	296
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3084	1583
v/s Ratio Prot					c0.24	
v/s Ratio Perm		c0.21			0.09	0.19
v/c Ratio		0.21			0.37	0.19
Uniform Delay, d1		0.0			2.8	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.3			0.1	0.2
Delay (s)		0.3			0.4	0.2
Level of Service		A			A	A
Approach Delay (s)	0.3			0.0	0.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

No Build (2023) Conditions

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1487	349	1121	940	491
v/c Ratio	0.96	0.46	0.65	0.69	0.68
Control Delay	37.6	12.9	0.2	28.1	22.9
Queue Delay	0.0	0.0	10.3	0.0	0.0
Total Delay	37.6	12.9	10.5	28.1	22.9
Queue Length 50th (ft)	476	90	0	256	181
Queue Length 95th (ft)	m#632	m113	m0	328	303
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1557	751	1715	1362	718
Starvation Cap Reductn	0	0	573	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.46	0.98	0.69	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1368	321	0	1031	0	0	865	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1487	349	0	1121	0	0	940	491
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1487	294	0	1121	0	0	940	406
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1557	696		1715			1362	633
v/s Ratio Prot					c0.42	0.19		c0.31			c0.28	0.26
v/s Ratio Perm												
v/c Ratio					0.96	0.42		0.65			0.69	0.64
Uniform Delay, d1					27.0	19.3		19.7			24.9	24.2
Progression Factor					0.91	0.80		0.00			1.00	1.00
Incremental Delay, d2					11.4	0.3		0.1			2.9	4.9
Delay (s)					35.9	15.7		0.1			27.7	29.1
Level of Service					D	B		A			C	C
Approach Delay (s)		0.0			32.1			0.1			28.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1260	439	1984
v/c Ratio	0.89	0.21	0.77
Control Delay	17.8	0.0	4.1
Queue Delay	0.0	0.4	1.4
Total Delay	17.8	0.4	5.5
Queue Length 50th (ft)	104	0	121
Queue Length 95th (ft)	#273	m0	m43
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1411	2137	2578
Starvation Cap Reductn	0	1147	370
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.89	0.44	0.90

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1159	404	1825	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1260	439	1984	0	0
RTOR Reduction (vph)	0	736	228	538	0	0
Lane Group Flow (vph)	0	524	211	1446	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		675	1647	2118		
v/s Ratio Prot		c0.19	0.06	c0.46		
v/s Ratio Perm				0.05		
v/c Ratio		0.78	0.13	0.68		
Uniform Delay, d1		35.5	14.4	7.7		
Progression Factor		1.00	1.00	12.10		
Incremental Delay, d2		5.6	0.0	0.1		
Delay (s)		41.1	14.4	93.4		
Level of Service		D	B	F		
Approach Delay (s)	41.1		79.1		0.0	
Approach LOS	D		E		A	

Intersection Summary			
HCM 2000 Control Delay	66.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	NBR	SBR	NEL
Lane Group Flow (vph)	730	1068	801	940	2012
v/c Ratio	0.86	0.87	0.58	0.73	1.52
Control Delay	40.2	27.5	18.2	6.4	266.2
Queue Delay	49.4	6.7	0.0	0.2	0.0
Total Delay	89.6	34.1	18.2	6.6	266.3
Queue Length 50th (ft)	205	209	176	67	~929
Queue Length 95th (ft)	#325	#398	240	75	#1065
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	849	1226	1388	1287	1320
Starvation Cap Reductn	226	126	0	43	0
Spillback Cap Reductn	0	0	0	0	15
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.17	0.97	0.58	0.76	1.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	672	983	737	865	1031	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.93	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	2787	2682	3300	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	2787	2682	3300	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	1068	801	940	1121	891
RTOR Reduction (vph)	0	0	51	0	0	0
Lane Group Flow (vph)	730	1068	750	940	2012	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	849	1226	1337	1287	1320	
v/s Ratio Prot	0.21	c0.21	0.27	c0.35	c0.61	
v/s Ratio Perm		0.17				
v/c Ratio	0.86	0.87	0.56	0.73	1.52	
Uniform Delay, d1	36.4	27.6	18.5	20.8	30.0	
Progression Factor	0.79	0.73	1.00	0.18	1.00	
Incremental Delay, d2	8.2	6.6	0.5	1.6	239.8	
Delay (s)	37.1	26.7	19.0	5.3	269.8	
Level of Service	D	C	B	A	F	
Approach Delay (s)	30.9				269.8	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	111.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	487	1312	666
v/c Ratio	0.30	0.42	0.42
Control Delay	0.5	0.3	0.4
Queue Delay	0.0	1.2	0.0
Total Delay	0.5	1.5	0.4
Queue Length 50th (ft)	0	5	0
Queue Length 95th (ft)	0	m6	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3114	1583
Starvation Cap Reductn	0	1477	0
Spillback Cap Reductn	169	299	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.80	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	448	0	0	1207	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	0	0	1312	666
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	487	0	0	1312	666
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3114	1583
v/s Ratio Prot					c0.27	
v/s Ratio Perm		0.30			0.10	c0.42
v/c Ratio		0.30			0.42	0.42
Uniform Delay, d1		0.0			3.0	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.5			0.0	0.4
Delay (s)		0.5			0.4	0.4
Level of Service		A			A	A
Approach Delay (s)	0.5			0.0	0.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1433	398	1066	1003	315
v/c Ratio	0.93	0.53	0.63	0.72	0.44
Control Delay	31.5	12.9	0.2	28.7	13.8
Queue Delay	0.0	0.0	3.9	0.0	0.0
Total Delay	31.5	12.9	4.0	28.7	13.8
Queue Length 50th (ft)	452	97	0	277	74
Queue Length 95th (ft)	m511	m118	m0	353	148
Internal Link Dist (ft)	37		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1542	751	1698	1402	712
Starvation Cap Reductn	0	0	531	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.93	0.53	0.91	0.72	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1318	366	0	981	0	0	923	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3505	1583		3539			3505	1568
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3505	1583		3539			3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1433	398	0	1066	0	0	1003	315
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1433	343	0	1066	0	0	1003	230
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	0%	2%	0%	0%	3%	3%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1542	696		1698			1402	627
v/s Ratio Prot					c0.41	0.22		c0.30			c0.29	0.15
v/s Ratio Perm												
v/c Ratio					0.93	0.49		0.63			0.72	0.37
Uniform Delay, d1					26.5	20.0		19.4			25.2	21.1
Progression Factor					0.85	0.73		0.00			1.00	1.00
Incremental Delay, d2					7.3	0.4		0.1			3.1	1.7
Delay (s)					29.8	14.9		0.1			28.4	22.7
Level of Service					C	B		A			C	C
Approach Delay (s)		0.0			26.5			0.1			27.0	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1361	439	1576
v/c Ratio	0.96	0.22	0.63
Control Delay	27.7	0.1	3.2
Queue Delay	0.0	0.3	0.5
Total Delay	27.7	0.5	3.7
Queue Length 50th (ft)	164	0	63
Queue Length 95th (ft)	#351	m0	m36
Internal Link Dist (ft)		168	
Turn Bay Length (ft)			
Base Capacity (vph)	1417	2031	2516
Starvation Cap Reductn	0	1022	458
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.96	0.44	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1252	404	1450	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2842	3213	2814		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2842	3213	2814		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1361	439	1576	0	0
RTOR Reduction (vph)	0	736	228	441	0	0
Lane Group Flow (vph)	0	625	211	1135	0	0
Heavy Vehicles (%)	0%	0%	9%	1%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		682	1542	2138		
v/s Ratio Prot		c0.22	0.07	c0.36		
v/s Ratio Perm				0.04		
v/c Ratio		0.92	0.14	0.53		
Uniform Delay, d1		37.0	14.5	6.3		
Progression Factor		1.00	1.00	13.25		
Incremental Delay, d2		17.1	0.0	0.1		
Delay (s)		54.1	14.5	84.2		
Level of Service		D	B	F		
Approach Delay (s)	54.1		69.0		0.0	
Approach LOS	D		E		A	

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	NBR	SBR	NEL
Lane Group Flow (vph)	567	1199	711	1003	1803
v/c Ratio	0.66	0.99	0.51	0.76	1.38
Control Delay	28.3	40.9	16.2	7.2	203.4
Queue Delay	13.1	6.7	0.0	0.2	0.0
Total Delay	41.3	47.7	16.2	7.4	203.4
Queue Length 50th (ft)	130	173	140	74	~790
Queue Length 95th (ft)	195	#578	198	81	#925
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	857	1214	1386	1324	1307
Starvation Cap Reductn	272	33	0	44	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	1.02	0.51	0.78	1.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	522	1103	654	923	981	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.94	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3574	2760	2760	2760	3269	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3574	2760	2760	2760	3269	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	567	1199	711	1003	1066	737
RTOR Reduction (vph)	0	0	61	0	0	0
Lane Group Flow (vph)	567	1199	650	1003	1803	0
Heavy Vehicles (%)	1%	3%	3%	3%	2%	4%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	857	1214	1324	1324	1307	
v/s Ratio Prot	0.16	c0.24	0.24	c0.36	c0.55	
v/s Ratio Perm		0.20				
v/c Ratio	0.66	0.99	0.49	0.76	1.38	
Uniform Delay, d1	34.3	29.8	17.7	21.2	30.0	
Progression Factor	0.71	0.61	1.00	0.20	1.00	
Incremental Delay, d2	1.8	21.7	0.3	1.7	175.6	
Delay (s)	26.1	39.8	18.0	6.0	205.6	
Level of Service	C	D	B	A	F	
Approach Delay (s)	35.4				205.6	
Approach LOS	D				F	

Intersection Summary			
HCM 2000 Control Delay	85.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	373	1393	354
v/c Ratio	0.23	0.45	0.22
Control Delay	0.3	0.4	0.2
Queue Delay	0.0	0.8	0.0
Total Delay	0.4	1.2	0.2
Queue Length 50th (ft)	0	4	0
Queue Length 95th (ft)	0	m4	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3084	1583
Starvation Cap Reductn	0	1260	0
Spillback Cap Reductn	144	245	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.76	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↑↑	↗
Volume (vph)	0	343	0	0	1282	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3505	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3505	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	373	0	0	1393	354
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	373	0	0	1393	354
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3084	1583
v/s Ratio Prot					c0.29	
v/s Ratio Perm		c0.23			0.11	0.22
v/c Ratio		0.23			0.45	0.22
Uniform Delay, d1		0.0			3.1	0.0
Progression Factor		1.00			0.09	1.00
Incremental Delay, d2		0.3			0.1	0.2
Delay (s)		0.3			0.3	0.2
Level of Service		A			A	A
Approach Delay (s)	0.3			0.0	0.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Build (2023) Conditions

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1495	349	1121	940	491
v/c Ratio	0.96	0.46	0.65	0.69	0.68
Control Delay	38.3	12.8	0.2	28.1	22.9
Queue Delay	0.0	0.0	10.3	0.0	0.0
Total Delay	38.3	12.8	10.5	28.1	22.9
Queue Length 50th (ft)	480	90	0	256	181
Queue Length 95th (ft)	m#634	m112	m0	328	303
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1557	751	1715	1362	718
Starvation Cap Reductn	0	0	573	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.46	0.98	0.69	0.68

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1375	321	0	1031	0	0	865	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1495	349	0	1121	0	0	940	491
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1495	294	0	1121	0	0	940	406
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1557	696		1715			1362	633
v/s Ratio Prot					c0.42	0.19		c0.31			c0.28	0.26
v/s Ratio Perm												
v/c Ratio					0.96	0.42		0.65			0.69	0.64
Uniform Delay, d1					27.2	19.3		19.7			24.9	24.2
Progression Factor					0.90	0.79		0.00			1.00	1.00
Incremental Delay, d2					12.2	0.3		0.1			2.9	4.9
Delay (s)					36.8	15.6		0.1			27.7	29.1
Level of Service					D	B		A			C	C
Approach Delay (s)		0.0			32.8			0.1			28.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1267	439	1991
v/c Ratio	0.90	0.21	0.77
Control Delay	18.3	0.0	4.1
Queue Delay	0.0	0.4	1.4
Total Delay	18.3	0.4	5.5
Queue Length 50th (ft)	109	0	120
Queue Length 95th (ft)	#279	m0	m43
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1411	2137	2578
Starvation Cap Reductn	0	1148	369
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.90	0.44	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1166	404	1832	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1267	439	1991	0	0
RTOR Reduction (vph)	0	736	228	538	0	0
Lane Group Flow (vph)	0	531	211	1453	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		675	1647	2118		
v/s Ratio Prot		c0.19	0.06	c0.47		
v/s Ratio Perm				0.05		
v/c Ratio		0.79	0.13	0.69		
Uniform Delay, d1		35.6	14.4	7.7		
Progression Factor		1.00	1.00	11.71		
Incremental Delay, d2		6.0	0.0	0.1		
Delay (s)		41.7	14.4	90.8		
Level of Service		D	B	F		
Approach Delay (s)	41.7		77.0		0.0	
Approach LOS	D		E		A	

Intersection Summary			
HCM 2000 Control Delay	64.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	730	1076	809	940	2012
v/c Ratio	0.86	0.88	0.58	0.73	1.52
Control Delay	40.2	28.0	18.3	6.4	266.2
Queue Delay	49.4	6.9	0.0	0.2	0.0
Total Delay	89.6	34.9	18.3	6.6	266.3
Queue Length 50th (ft)	205	214	178	67	~929
Queue Length 95th (ft)	#325	#419	244	75	#1065
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	849	1226	1388	1287	1320
Starvation Cap Reductn	226	121	0	43	0
Spillback Cap Reductn	0	0	0	0	15
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.17	0.97	0.58	0.76	1.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	672	990	744	865	1031	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.93	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	2787	2682	3300	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	2787	2682	3300	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	1076	809	940	1121	891
RTOR Reduction (vph)	0	0	51	0	0	0
Lane Group Flow (vph)	730	1076	758	940	2012	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	849	1226	1337	1287	1320	
v/s Ratio Prot	0.21	c0.21	0.27	c0.35	c0.61	
v/s Ratio Perm		0.18				
v/c Ratio	0.86	0.88	0.57	0.73	1.52	
Uniform Delay, d1	36.4	27.7	18.6	20.8	30.0	
Progression Factor	0.80	0.73	1.00	0.18	1.00	
Incremental Delay, d2	8.2	6.9	0.6	1.6	239.8	
Delay (s)	37.2	27.1	19.1	5.3	269.8	
Level of Service	D	C	B	A	F	
Approach Delay (s)	31.2				269.8	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	111.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	487	1320	666
v/c Ratio	0.30	0.42	0.42
Control Delay	0.5	0.3	0.4
Queue Delay	0.0	1.2	0.0
Total Delay	0.5	1.5	0.4
Queue Length 50th (ft)	0	5	0
Queue Length 95th (ft)	0	m6	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3114	1583
Starvation Cap Reductn	0	1475	0
Spillback Cap Reductn	178	296	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.81	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	448	0	0	1214	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	0	0	1320	666
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	487	0	0	1320	666
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3114	1583
v/s Ratio Prot					c0.27	
v/s Ratio Perm		0.30			0.10	c0.42
v/c Ratio		0.30			0.42	0.42
Uniform Delay, d1		0.0			3.0	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.5			0.0	0.4
Delay (s)		0.5			0.4	0.4
Level of Service		A			A	A
Approach Delay (s)	0.5			0.0	0.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1443	398	1066	1003	315
v/c Ratio	0.94	0.53	0.63	0.72	0.44
Control Delay	32.0	12.8	0.2	28.7	13.8
Queue Delay	0.0	0.0	3.9	0.0	0.0
Total Delay	32.0	12.8	4.0	28.7	13.8
Queue Length 50th (ft)	457	96	0	277	74
Queue Length 95th (ft)	m511	m117	m0	353	148
Internal Link Dist (ft)	37		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1542	751	1698	1402	712
Starvation Cap Reductn	0	0	531	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.91	0.72	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1328	366	0	981	0	0	923	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3505	1583		3539			3505	1568
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3505	1583		3539			3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1443	398	0	1066	0	0	1003	315
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1443	343	0	1066	0	0	1003	230
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	0%	2%	0%	0%	3%	3%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1542	696		1698			1402	627
v/s Ratio Prot					c0.41	0.22		c0.30			c0.29	0.15
v/s Ratio Perm												
v/c Ratio					0.94	0.49		0.63			0.72	0.37
Uniform Delay, d1					26.7	20.0		19.4			25.2	21.1
Progression Factor					0.84	0.72		0.00			1.00	1.00
Incremental Delay, d2					7.8	0.4		0.1			3.1	1.7
Delay (s)					30.3	14.8		0.1			28.4	22.7
Level of Service					C	B		A			C	C
Approach Delay (s)		0.0			27.0			0.1			27.0	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1372	439	1586
v/c Ratio	0.97	0.22	0.63
Control Delay	29.3	0.1	3.2
Queue Delay	0.0	0.3	0.5
Total Delay	29.3	0.5	3.7
Queue Length 50th (ft)	171	0	63
Queue Length 95th (ft)	#360	m0	m36
Internal Link Dist (ft)		168	
Turn Bay Length (ft)			
Base Capacity (vph)	1417	2031	2519
Starvation Cap Reductn	0	1024	457
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.97	0.44	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1262	404	1459	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2842	3213	2814		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2842	3213	2814		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1372	439	1586	0	0
RTOR Reduction (vph)	0	736	228	444	0	0
Lane Group Flow (vph)	0	636	211	1142	0	0
Heavy Vehicles (%)	0%	0%	9%	1%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		682	1542	2138		
v/s Ratio Prot		c0.22	0.07	c0.36		
v/s Ratio Perm				0.04		
v/c Ratio		0.93	0.14	0.53		
Uniform Delay, d1		37.2	14.5	6.4		
Progression Factor		1.00	1.00	13.27		
Incremental Delay, d2		19.7	0.0	0.1		
Delay (s)		56.9	14.5	84.6		
Level of Service		E	B	F		
Approach Delay (s)	56.9		69.4		0.0	
Approach LOS	E		E		A	

Intersection Summary			
HCM 2000 Control Delay	64.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	567	1209	721	1003	1803
v/c Ratio	0.66	0.97	0.52	0.76	1.38
Control Delay	28.3	36.2	16.3	7.2	203.4
Queue Delay	13.1	7.9	0.0	0.2	0.0
Total Delay	41.4	44.1	16.3	7.4	203.4
Queue Length 50th (ft)	131	173	144	74	~790
Queue Length 95th (ft)	195	#571	201	81	#925
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	857	1250	1386	1324	1307
Starvation Cap Reductn	272	50	0	44	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	1.01	0.52	0.78	1.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	522	1112	663	923	981	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.94	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3574	2842	2760	2760	3269	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3574	2842	2760	2760	3269	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	567	1209	721	1003	1066	737
RTOR Reduction (vph)	0	0	61	0	0	0
Lane Group Flow (vph)	567	1209	660	1003	1803	0
Heavy Vehicles (%)	1%	0%	3%	3%	2%	4%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	857	1250	1324	1324	1307	
v/s Ratio Prot	0.16	c0.23	0.24	c0.36	c0.55	
v/s Ratio Perm		0.19				
v/c Ratio	0.66	0.97	0.50	0.76	1.38	
Uniform Delay, d1	34.3	29.4	17.8	21.2	30.0	
Progression Factor	0.71	0.61	1.00	0.20	1.00	
Incremental Delay, d2	1.8	17.1	0.3	1.7	175.6	
Delay (s)	26.1	35.0	18.1	6.0	205.6	
Level of Service	C	D	B	A	F	
Approach Delay (s)	32.2				205.6	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	84.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	373	1404	354
v/c Ratio	0.23	0.46	0.22
Control Delay	0.3	0.3	0.2
Queue Delay	0.0	0.8	0.0
Total Delay	0.4	1.2	0.2
Queue Length 50th (ft)	0	4	0
Queue Length 95th (ft)	0	m4	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3084	1583
Starvation Cap Reductn	0	1256	0
Spillback Cap Reductn	154	267	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.77	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	343	0	0	1292	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3505	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3505	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	373	0	0	1404	354
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	373	0	0	1404	354
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3084	1583
v/s Ratio Prot					c0.29	
v/s Ratio Perm		c0.23			0.11	0.22
v/c Ratio		0.23			0.46	0.22
Uniform Delay, d1		0.0			3.1	0.0
Progression Factor		1.00			0.09	1.00
Incremental Delay, d2		0.3			0.1	0.2
Delay (s)		0.3			0.3	0.2
Level of Service		A			A	A
Approach Delay (s)	0.3			0.0	0.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1491	349	1121	940	491
v/c Ratio	0.96	0.46	0.65	0.69	0.68
Control Delay	37.9	12.8	0.2	28.1	22.9
Queue Delay	0.0	0.0	10.3	0.0	0.0
Total Delay	37.9	12.8	10.5	28.1	22.9
Queue Length 50th (ft)	478	90	0	256	181
Queue Length 95th (ft)	m#633	m113	m0	328	303
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1557	751	1715	1362	718
Starvation Cap Reductn	0	0	573	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.46	0.98	0.69	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1372	321	0	1031	0	0	865	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1491	349	0	1121	0	0	940	491
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1491	294	0	1121	0	0	940	406
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1557	696		1715			1362	633
v/s Ratio Prot					c0.42	0.19		c0.31			c0.28	0.26
v/s Ratio Perm												
v/c Ratio					0.96	0.42		0.65			0.69	0.64
Uniform Delay, d1					27.1	19.3		19.7			24.9	24.2
Progression Factor					0.91	0.80		0.00			1.00	1.00
Incremental Delay, d2					11.7	0.3		0.1			2.9	4.9
Delay (s)					36.3	15.7		0.1			27.7	29.1
Level of Service					D	B		A			C	C
Approach Delay (s)		0.0			32.4			0.1			28.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1264	439	1988
v/c Ratio	0.90	0.21	0.77
Control Delay	18.1	0.0	4.1
Queue Delay	0.0	0.4	1.4
Total Delay	18.1	0.4	5.5
Queue Length 50th (ft)	107	0	121
Queue Length 95th (ft)	#277	m0	m43
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1411	2137	2578
Starvation Cap Reductn	0	1148	369
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.90	0.44	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1163	404	1829	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1264	439	1988	0	0
RTOR Reduction (vph)	0	736	228	538	0	0
Lane Group Flow (vph)	0	528	211	1450	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		675	1647	2118		
v/s Ratio Prot		c0.19	0.06	c0.47		
v/s Ratio Perm				0.05		
v/c Ratio		0.78	0.13	0.68		
Uniform Delay, d1		35.6	14.4	7.7		
Progression Factor		1.00	1.00	11.90		
Incremental Delay, d2		5.9	0.0	0.1		
Delay (s)		41.5	14.4	92.1		
Level of Service		D	B	F		
Approach Delay (s)	41.5		78.1		0.0	
Approach LOS	D		E		A	

Intersection Summary			
HCM 2000 Control Delay	65.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	730	1073	805	940	2012
v/c Ratio	0.86	0.88	0.58	0.73	1.52
Control Delay	40.2	27.8	18.2	6.4	266.2
Queue Delay	49.4	6.8	0.0	0.2	0.0
Total Delay	89.6	34.6	18.2	6.6	266.3
Queue Length 50th (ft)	205	212	177	67	~929
Queue Length 95th (ft)	#324	#409	242	75	#1065
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	849	1226	1388	1287	1320
Starvation Cap Reductn	226	123	0	43	0
Spillback Cap Reductn	0	0	0	0	15
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.17	0.97	0.58	0.76	1.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	672	987	741	865	1031	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	0.85	0.85	0.93	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	2787	2682	3300	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	2787	2682	3300	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	1073	805	940	1121	891
RTOR Reduction (vph)	0	0	51	0	0	0
Lane Group Flow (vph)	730	1073	754	940	2012	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	48.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	48.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.48	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	849	1226	1337	1287	1320	
v/s Ratio Prot	0.21	c0.21	0.27	c0.35	c0.61	
v/s Ratio Perm		0.18				
v/c Ratio	0.86	0.88	0.56	0.73	1.52	
Uniform Delay, d1	36.4	27.7	18.5	20.8	30.0	
Progression Factor	0.80	0.73	1.00	0.18	1.00	
Incremental Delay, d2	8.2	6.8	0.5	1.6	239.8	
Delay (s)	37.1	26.9	19.1	5.3	269.8	
Level of Service	D	C	B	A	F	
Approach Delay (s)	31.1				269.8	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	111.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	487	1316	666
v/c Ratio	0.30	0.42	0.42
Control Delay	0.5	0.3	0.4
Queue Delay	0.0	1.2	0.0
Total Delay	0.5	1.5	0.4
Queue Length 50th (ft)	0	5	0
Queue Length 95th (ft)	0	m6	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3114	1583
Starvation Cap Reductn	0	1476	0
Spillback Cap Reductn	176	298	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.80	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	448	0	0	1211	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	0	0	1316	666
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	487	0	0	1316	666
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3114	1583
v/s Ratio Prot					c0.27	
v/s Ratio Perm		0.30			0.10	c0.42
v/c Ratio		0.30			0.42	0.42
Uniform Delay, d1		0.0			3.0	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.5			0.0	0.4
Delay (s)		0.5			0.4	0.4
Level of Service		A			A	A
Approach Delay (s)	0.5			0.0	0.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Build (2023) Mitigated Conditions

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1495	349	1121	940	491
v/c Ratio	1.06	0.51	0.60	0.61	0.62
Control Delay	67.6	16.6	0.1	24.7	20.4
Queue Delay	0.0	0.0	2.9	0.0	0.0
Total Delay	67.6	16.6	3.0	24.7	20.4
Queue Length 50th (ft)	~613	110	0	256	189
Queue Length 95th (ft)	m#722	m136	m0	323	304
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1415	686	1884	1548	789
Starvation Cap Reductn	0	0	628	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.06	0.51	0.89	0.61	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1375	321	0	1031	0	0	865	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1495	349	0	1121	0	0	940	491
RTOR Reduction (vph)	0	0	0	0	0	53	0	0	0	0	0	70
Lane Group Flow (vph)	0	0	0	0	1495	296	0	1121	0	0	940	421
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		58.0			50.0	50.0
Effective Green, g (s)					44.0	44.0		58.0			50.0	50.0
Actuated g/C Ratio					0.40	0.40		0.53			0.45	0.45
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1415	633		1884			1548	719
v/s Ratio Prot					c0.42	0.19		c0.31			c0.28	0.27
v/s Ratio Perm												
v/c Ratio					1.06	0.47		0.60			0.61	0.59
Uniform Delay, d1					33.0	24.3		17.9			22.6	22.3
Progression Factor					0.89	0.79		0.00			1.00	1.00
Incremental Delay, d2					37.8	0.4		0.0			1.8	3.5
Delay (s)					67.2	19.7		0.0			24.4	25.8
Level of Service					E	B		A			C	C
Approach Delay (s)		0.0			58.2			0.0			24.9	
Approach LOS		A			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1268	439	1991
v/c Ratio	0.93	0.19	0.77
Control Delay	22.9	0.1	4.8
Queue Delay	0.0	0.4	1.6
Total Delay	22.9	0.5	6.3
Queue Length 50th (ft)	135	0	131
Queue Length 95th (ft)	#311	m0	m93
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1365	2254	2597
Starvation Cap Reductn	0	1298	398
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.93	0.46	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1167	404	1832	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1268	439	1991	0	0
RTOR Reduction (vph)	0	751	208	489	0	0
Lane Group Flow (vph)	0	517	231	1502	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	58.0	82.0		
Effective Green, g (s)		24.0	58.0	82.0		
Actuated g/C Ratio		0.22	0.53	0.75		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		613	1810	2178		
v/s Ratio Prot		c0.18	0.07	c0.49		
v/s Ratio Perm				0.05		
v/c Ratio		0.84	0.13	0.69		
Uniform Delay, d1		41.2	13.2	7.3		
Progression Factor		1.00	1.00	14.01		
Incremental Delay, d2		10.2	0.0	0.3		
Delay (s)		51.4	13.2	103.1		
Level of Service		D	B	F		
Approach Delay (s)	51.4		86.9		0.0	
Approach LOS	D		F		A	

Intersection Summary			
HCM 2000 Control Delay	74.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	730	1077	808	940	2012
v/c Ratio	0.95	1.00	0.58	0.57	1.25
Control Delay	56.0	39.0	24.0	1.9	147.8
Queue Delay	44.9	11.0	0.1	0.0	0.1
Total Delay	100.9	50.0	24.1	1.9	147.9
Queue Length 50th (ft)	243	138	218	18	~917
Queue Length 95th (ft)	#380	#323	286	8	#1053
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	772	1078	1395	1663	1606
Starvation Cap Reductn	207	39	0	46	0
Spillback Cap Reductn	0	0	43	0	26
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.29	1.04	0.60	0.58	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	672	991	743	865	1031	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	3278	3155	3535	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	3278	3155	3535	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	1077	808	940	1121	891
RTOR Reduction (vph)	0	471	54	0	0	0
Lane Group Flow (vph)	730	606	754	940	2012	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	Perm	custom	custom	Prot	
Protected Phases	5 6		2 3 4	1 2 3	1 2	
Permitted Phases		5 6				
Actuated Green, G (s)	24.0	24.0	45.0	58.0	50.0	
Effective Green, g (s)	24.0	24.0	45.0	58.0	50.0	
Actuated g/C Ratio	0.22	0.22	0.41	0.53	0.45	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	772	608	1341	1663	1606	
v/s Ratio Prot	0.21		c0.23	0.30	c0.57	
v/s Ratio Perm		c0.22				
v/c Ratio	0.95	1.00	0.56	0.57	1.25	
Uniform Delay, d1	42.4	43.0	24.9	17.5	30.0	
Progression Factor	0.81	0.56	1.00	0.04	1.00	
Incremental Delay, d2	19.3	34.4	0.5	0.4	119.1	
Delay (s)	53.6	58.6	25.5	1.1	149.1	
Level of Service	D	E	C	A	F	
Approach Delay (s)	56.5				149.1	
Approach LOS	E				F	

Intersection Summary			
HCM 2000 Control Delay	76.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	487	1321	666
v/c Ratio	0.30	0.42	0.42
Control Delay	0.5	0.3	0.5
Queue Delay	0.1	1.6	0.0
Total Delay	0.5	1.8	0.5
Queue Length 50th (ft)	0	5	0
Queue Length 95th (ft)	0	m5	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3152	1583
Starvation Cap Reductn	0	1572	0
Spillback Cap Reductn	185	342	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.84	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	448	0	0	1215	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	0	0	1321	666
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	487	0	0	1321	666
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		110.0			90.0	110.0
Effective Green, g (s)		110.0			90.0	110.0
Actuated g/C Ratio		1.00			0.82	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3152	1583
v/s Ratio Prot					0.28	
v/s Ratio Perm		0.30			0.09	c0.42
v/c Ratio		0.30			0.42	0.42
Uniform Delay, d1		0.0			2.8	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.5			0.0	0.3
Delay (s)		0.5			0.3	0.3
Level of Service		A			A	A
Approach Delay (s)	0.5			0.0	0.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1445	398	1066	1003	315
v/c Ratio	0.94	0.53	0.63	0.72	0.44
Control Delay	32.1	12.7	0.2	28.7	13.8
Queue Delay	0.0	0.0	2.7	0.0	0.0
Total Delay	32.1	12.7	2.8	28.7	13.8
Queue Length 50th (ft)	457	96	0	277	74
Queue Length 95th (ft)	m513	m118	m0	353	148
Internal Link Dist (ft)	37		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1542	751	1698	1402	712
Starvation Cap Reductn	0	0	492	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.88	0.72	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1329	366	0	981	0	0	923	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3505	1583		3539			3505	1568
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3505	1583		3539			3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1445	398	0	1066	0	0	1003	315
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1445	343	0	1066	0	0	1003	230
Heavy Vehicles (%)	2%	2%	2%	0%	3%	2%	0%	2%	0%	0%	3%	3%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1542	696		1698			1402	627
v/s Ratio Prot					c0.41	0.22		c0.30			c0.29	0.15
v/s Ratio Perm												
v/c Ratio					0.94	0.49		0.63			0.72	0.37
Uniform Delay, d1					26.7	20.0		19.4			25.2	21.1
Progression Factor					0.84	0.71		0.00			1.00	1.00
Incremental Delay, d2					7.9	0.4		0.1			3.1	1.7
Delay (s)					30.4	14.6		0.1			28.4	22.7
Level of Service					C	B		A			C	C
Approach Delay (s)		0.0			27.0			0.1			27.0	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1373	439	1587
v/c Ratio	0.97	0.22	0.63
Control Delay	29.4	0.1	3.4
Queue Delay	0.0	0.3	0.5
Total Delay	29.4	0.4	3.9
Queue Length 50th (ft)	172	0	63
Queue Length 95th (ft)	#360	m0	m39
Internal Link Dist (ft)		168	
Turn Bay Length (ft)			
Base Capacity (vph)	1417	2031	2519
Starvation Cap Reductn	0	1005	434
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.97	0.43	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1263	404	1460	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2842	3213	2814		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2842	3213	2814		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1373	439	1587	0	0
RTOR Reduction (vph)	0	736	228	444	0	0
Lane Group Flow (vph)	0	637	211	1143	0	0
Heavy Vehicles (%)	0%	0%	9%	1%	2%	2%
Turn Type		Perm	Prot	custom		
Protected Phases			1 2 3	1 2 3 4		
Permitted Phases		4 5		5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		682	1542	2138		
v/s Ratio Prot			0.07	c0.36		
v/s Ratio Perm		c0.22		0.04		
v/c Ratio		0.93	0.14	0.53		
Uniform Delay, d1		37.2	14.5	6.4		
Progression Factor		1.00	1.00	14.08		
Incremental Delay, d2		19.9	0.0	0.1		
Delay (s)		57.2	14.5	89.8		
Level of Service		E	B	F		
Approach Delay (s)	57.2		73.5		0.0	
Approach LOS	E		E		A	

Intersection Summary			
HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	567	1211	722	1003	1803
v/c Ratio	0.66	0.92	0.48	0.64	1.30
Control Delay	28.3	26.1	17.5	2.3	166.7
Queue Delay	13.1	2.6	0.0	0.1	0.0
Total Delay	41.3	28.7	17.5	2.4	166.7
Queue Length 50th (ft)	130	144	148	20	~761
Queue Length 95th (ft)	195	#521	203	9	#896
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	857	1316	1497	1558	1392
Starvation Cap Reductn	272	49	0	52	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	0.96	0.48	0.67	1.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	522	1114	664	923	981	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3574	2842	3247	3247	3482	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3574	2842	3247	3247	3482	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	567	1211	722	1003	1066	737
RTOR Reduction (vph)	0	71	69	0	0	0
Lane Group Flow (vph)	567	1140	653	1003	1803	0
Heavy Vehicles (%)	1%	0%	3%	3%	2%	4%
Turn Type	NA	custom	Perm	custom	Prot	
Protected Phases	5 6	5 6		1 2 3	1 2	
Permitted Phases		4	2 3 4			
Actuated Green, G (s)	24.0	40.0	44.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	44.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.44	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	857	1250	1428	1558	1392	
v/s Ratio Prot	0.16	c0.22		c0.31	c0.52	
v/s Ratio Perm		0.18	0.20			
v/c Ratio	0.66	0.91	0.46	0.64	1.30	
Uniform Delay, d1	34.3	28.3	19.6	19.6	30.0	
Progression Factor	0.71	0.58	1.00	0.05	1.00	
Incremental Delay, d2	1.8	9.6	0.2	0.6	138.3	
Delay (s)	26.1	26.0	19.9	1.5	168.3	
Level of Service	C	C	B	A	F	
Approach Delay (s)	26.0				168.3	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	68.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	373	1405	354
v/c Ratio	0.23	0.46	0.22
Control Delay	0.3	0.3	0.2
Queue Delay	0.0	0.8	0.0
Total Delay	0.3	1.2	0.2
Queue Length 50th (ft)	0	4	0
Queue Length 95th (ft)	0	m4	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3084	1583
Starvation Cap Reductn	0	1257	0
Spillback Cap Reductn	90	141	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.77	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	343	0	0	1293	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3505	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3505	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	373	0	0	1405	354
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	373	0	0	1405	354
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3084	1583
v/s Ratio Prot					c0.29	
v/s Ratio Perm		c0.23			0.11	0.22
v/c Ratio		0.23			0.46	0.22
Uniform Delay, d1		0.0			3.1	0.0
Progression Factor		1.00			0.09	1.00
Incremental Delay, d2		0.3			0.1	0.2
Delay (s)		0.3			0.3	0.2
Level of Service		A			A	A
Approach Delay (s)	0.3			0.0	0.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	1492	349	1121	940	491
v/c Ratio	0.96	0.46	0.65	0.69	0.68
Control Delay	37.9	12.7	0.2	28.1	22.9
Queue Delay	0.0	0.0	6.0	0.0	0.0
Total Delay	37.9	12.7	6.2	28.1	22.9
Queue Length 50th (ft)	479	90	0	256	181
Queue Length 95th (ft)	m#633	m112	m0	328	303
Internal Link Dist (ft)	40		201	165	
Turn Bay Length (ft)					
Base Capacity (vph)	1557	751	1715	1362	718
Starvation Cap Reductn	0	0	534	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.46	0.95	0.69	0.68

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱		↑↑			↑↑	↱
Volume (vph)	0	0	0	0	1373	321	0	1031	0	0	865	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	4.0
Lane Util. Factor					0.95	1.00		0.95			0.95	1.00
Frt					1.00	0.85		1.00			1.00	0.85
Flt Protected					1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)					3539	1583		3574			3406	1583
Flt Permitted					1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)					3539	1583		3574			3406	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1492	349	0	1121	0	0	940	491
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	0	85
Lane Group Flow (vph)	0	0	0	0	1492	294	0	1121	0	0	940	406
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	6%	2%
Turn Type					NA	Prot		NA			NA	Prot
Protected Phases					4 5 6	4 5 6		1 2 3			1 2	1 2
Permitted Phases												
Actuated Green, G (s)					44.0	44.0		48.0			40.0	40.0
Effective Green, g (s)					44.0	44.0		48.0			40.0	40.0
Actuated g/C Ratio					0.44	0.44		0.48			0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)					1557	696		1715			1362	633
v/s Ratio Prot					c0.42	0.19		c0.31			c0.28	0.26
v/s Ratio Perm												
v/c Ratio					0.96	0.42		0.65			0.69	0.64
Uniform Delay, d1					27.1	19.3		19.7			24.9	24.2
Progression Factor					0.90	0.79		0.00			1.00	1.00
Incremental Delay, d2					11.8	0.3		0.1			2.9	4.9
Delay (s)					36.2	15.5		0.1			27.7	29.1
Level of Service					D	B		A			C	C
Approach Delay (s)		0.0			32.3			0.1			28.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBR	NBL	NBR
Lane Group Flow (vph)	1265	439	1988
v/c Ratio	0.90	0.21	0.77
Control Delay	18.2	0.1	4.5
Queue Delay	0.0	0.3	0.9
Total Delay	18.2	0.4	5.5
Queue Length 50th (ft)	107	0	122
Queue Length 95th (ft)	#277	m0	m59
Internal Link Dist (ft)		199	
Turn Bay Length (ft)			
Base Capacity (vph)	1411	2137	2578
Starvation Cap Reductn	0	1121	309
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.90	0.43	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1164	404	1829	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.97	0.88		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2814	3433	2787		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2814	3433	2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1265	439	1988	0	0
RTOR Reduction (vph)	0	736	228	538	0	0
Lane Group Flow (vph)	0	529	211	1450	0	0
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Turn Type		custom	Prot	custom		
Protected Phases		4 5	1 2 3	1 2 3 4		
Permitted Phases				5		
Actuated Green, G (s)		24.0	48.0	72.0		
Effective Green, g (s)		24.0	48.0	72.0		
Actuated g/C Ratio		0.24	0.48	0.72		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		675	1647	2118		
v/s Ratio Prot		c0.19	0.06	c0.47		
v/s Ratio Perm				0.05		
v/c Ratio		0.78	0.13	0.68		
Uniform Delay, d1		35.6	14.4	7.7		
Progression Factor		1.00	1.00	11.71		
Incremental Delay, d2		6.0	0.0	0.3		
Delay (s)		41.5	14.4	90.8		
Level of Service		D	B	F		
Approach Delay (s)	41.5		77.0		0.0	
Approach LOS	D		E		A	

Intersection Summary			
HCM 2000 Control Delay	64.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR2	NBR	SBR	NEL
Lane Group Flow (vph)	730	1074	805	940	2012
v/c Ratio	0.86	0.82	0.54	0.62	1.42
Control Delay	40.2	20.7	19.4	2.2	221.9
Queue Delay	49.4	2.2	0.0	0.1	0.0
Total Delay	89.6	23.0	19.4	2.3	221.9
Queue Length 50th (ft)	205	153	182	18	~897
Queue Length 95th (ft)	#324	263	243	9	#1033
Internal Link Dist (ft)	158				322
Turn Bay Length (ft)					
Base Capacity (vph)	849	1305	1497	1514	1414
Starvation Cap Reductn	226	122	0	51	0
Spillback Cap Reductn	0	0	33	0	17
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.17	0.91	0.55	0.64	1.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR2	NBR	SBR	NEL	NER
Lane Configurations						
Volume (vph)	672	988	741	865	1031	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.88	0.88	0.88	0.97	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	3539	2787	3278	3155	3535	
Flt Permitted	1.00	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	3539	2787	3278	3155	3535	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	1074	805	940	1121	891
RTOR Reduction (vph)	0	85	55	0	0	0
Lane Group Flow (vph)	730	989	750	940	2012	0
Heavy Vehicles (%)	2%	2%	2%	6%	1%	2%
Turn Type	NA	custom	custom	custom	Prot	
Protected Phases	5 6	5 6	2 3 4	1 2 3	1 2	
Permitted Phases		4				
Actuated Green, G (s)	24.0	40.0	44.0	48.0	40.0	
Effective Green, g (s)	24.0	40.0	44.0	48.0	40.0	
Actuated g/C Ratio	0.24	0.40	0.44	0.48	0.40	
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	849	1226	1442	1514	1414	
v/s Ratio Prot	c0.21	c0.19	c0.23	0.30	c0.57	
v/s Ratio Perm		0.16				
v/c Ratio	0.86	0.81	0.52	0.62	1.42	
Uniform Delay, d1	36.4	26.6	20.3	19.3	30.0	
Progression Factor	0.80	0.70	1.00	0.04	1.00	
Incremental Delay, d2	8.2	3.7	0.3	0.6	194.5	
Delay (s)	37.2	22.2	20.7	1.4	224.5	
Level of Service	D	C	C	A	F	
Approach Delay (s)	28.3				224.5	
Approach LOS	C				F	

Intersection Summary			
HCM 2000 Control Delay	93.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBR	SBT	SBR
Lane Group Flow (vph)	487	1317	666
v/c Ratio	0.30	0.42	0.42
Control Delay	0.5	0.3	0.4
Queue Delay	0.0	1.2	0.0
Total Delay	0.5	1.5	0.4
Queue Length 50th (ft)	0	5	0
Queue Length 95th (ft)	0	m6	m0
Internal Link Dist (ft)		110	
Turn Bay Length (ft)			
Base Capacity (vph)	1611	3114	1583
Starvation Cap Reductn	0	1476	0
Spillback Cap Reductn	135	297	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.33	0.80	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	448	0	0	1212	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0
Lane Util. Factor		1.00			0.95	1.00
Frt		0.86			1.00	0.85
Flt Protected		1.00			1.00	1.00
Satd. Flow (prot)		1611			3539	1583
Flt Permitted		1.00			1.00	1.00
Satd. Flow (perm)		1611			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	487	0	0	1317	666
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	487	0	0	1317	666
Heavy Vehicles (%)	1%	2%	2%	2%	2%	2%
Turn Type		Free			NA	Free
Protected Phases					1 2 4 5	
Permitted Phases		Free			6	Free
Actuated Green, G (s)		100.0			80.0	100.0
Effective Green, g (s)		100.0			80.0	100.0
Actuated g/C Ratio		1.00			0.80	1.00
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1611			3114	1583
v/s Ratio Prot					c0.27	
v/s Ratio Perm		0.30			0.10	c0.42
v/c Ratio		0.30			0.42	0.42
Uniform Delay, d1		0.0			3.0	0.0
Progression Factor		1.00			0.11	1.00
Incremental Delay, d2		0.5			0.0	0.4
Delay (s)		0.5			0.4	0.4
Level of Service		A			A	A
Approach Delay (s)	0.5			0.0	0.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

B.7 Wellington Circle and Select Intersections, Medford

a. Synchro Output
   a. Existing (2013) Conditions
   b. No Build (2023) Conditions
   c. Build (2023) Conditions
   d. Build (2023) Mitigated Conditions

Synchro Output

Existing (2013) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	504	93	389	469	403	84	413	255	167	209	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3529	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	48	548	101	418	504	433	90	444	274	182	227	28
RTOR Reduction (vph)	0	11	0	0	0	283	0	79	0	0	8	0
Lane Group Flow (vph)	0	686	0	418	504	150	90	639	0	182	247	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	9.5	24.0		10.0	24.5	
Effective Green, g (s)		30.0		35.0	35.0	35.0	9.5	24.0		10.0	24.5	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.08	0.20		0.08	0.20	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		973		494	554	484	132	655		145	720	
v/s Ratio Prot		c0.18		0.25	c0.27		0.05	c0.19		c0.10	0.07	
v/s Ratio Perm						0.09						
v/c Ratio		0.70		0.85	0.91	0.31	0.68	0.98		1.26	0.34	
Uniform Delay, d1		41.0		40.0	41.0	33.1	53.8	47.7		55.0	40.9	
Progression Factor		1.00		0.91	0.91	1.45	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3		11.5	17.4	0.3	13.6	29.6		158.9	1.3	
Delay (s)		43.3		47.9	54.8	48.3	67.3	77.3		213.9	42.2	
Level of Service		D		D	D	D	E	E		F	D	
Approach Delay (s)		43.3			50.6			76.2			113.7	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	63.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰↰	↱
Volume (vph)	0	924	895	0	1143	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.94	0.94	0.96	0.96	0.95	0.95
Adj. Flow (vph)	0	983	932	0	1203	386
RTOR Reduction (vph)	0	0	0	0	0	90
Lane Group Flow (vph)	0	983	932	0	1203	296
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2246	2224		1115	519
v/s Ratio Prot		c0.26	0.24		c0.35	0.19
v/s Ratio Perm						
v/c Ratio		0.44	0.42		1.08	0.57
Uniform Delay, d1		14.0	13.8		40.5	33.6
Progression Factor		0.90	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		50.9	1.5
Delay (s)		12.7	13.9		91.4	35.1
Level of Service		B	B		F	D
Approach Delay (s)		12.7	13.9		77.7	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1651	149	94	986	1391	513	426	68	134	285	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.99			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7208			4789	3421	3286	4849			4873	1316
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7208			4789	3421	3286	4849			4873	1316
Peak-hour factor, PHF	0.96	0.96	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1720	155	97	1016	1434	558	463	74	146	310	88
RTOR Reduction (vph)	14	0	0	0	0	0	22	0	0	0	0
Lane Group Flow (vph)	1861	0	0	1113	1434	558	515	0	0	465	79
Heavy Vehicles (%)	2%	1%	0%	3%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1946			1245	1984	427	630			682	184
v/s Ratio Prot	c0.26			c0.23	0.42	c0.17	0.11			c0.10	0.06
v/s Ratio Perm											
v/c Ratio	0.96			0.89	0.72	1.31	0.82			0.68	0.43
Uniform Delay, d1	35.9			35.7	15.2	43.5	42.3			40.9	39.3
Progression Factor	1.00			1.70	0.80	1.00	1.00			0.22	0.19
Incremental Delay, d2	12.4			7.1	1.6	154.1	11.3			4.7	6.2
Delay (s)	48.3			67.8	13.7	197.6	53.6			13.7	13.7
Level of Service	D			E	B	F	D			B	B
Approach Delay (s)	48.3				37.3		127.0			13.7	
Approach LOS	D				D		F			B	

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	70	245	2093	2068	470	64	400	912	549	1083
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3479	6408	7471	1615		1610	3383	1599	2733
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3479	6408	7471	1615		1610	3383	1599	2733
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.97	0.97	0.97	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	74	258	2203	2132	485	66	435	991	597	1177
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	336	2203	2132	505	0	391	1035	597	1167
Heavy Vehicles (%)	0%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			487	2178	2988	646		499	1048	495	1530
v/s Ratio Prot			0.10	c0.34	0.29	c0.31		0.24	0.31	c0.37	c0.43
v/s Ratio Perm											
v/c Ratio			0.69	1.01	0.71	0.78		0.78	0.99	1.21	0.76
Uniform Delay, d1			40.9	33.0	25.2	26.2		31.4	34.3	34.5	16.9
Progression Factor			1.12	0.50	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			0.7	8.9	1.5	9.2		11.7	25.0	110.6	3.7
Delay (s)			46.5	25.6	26.7	35.4		43.1	59.3	145.1	20.6
Level of Service			D	C	C	D		D	E	F	C
Approach Delay (s)				28.4	28.5				59.1		
Approach LOS				C	C				E		

Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	1452	0	0	0	0	0	0	0	0	500	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6304	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6304	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1512	0	0	0	0	0	0	0	0	543	168
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	46	0
Lane Group Flow (vph)	0	1512	0	0	0	0	0	0	0	0	665	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1323	
v/s Ratio Prot		c0.29									c0.11	
v/s Ratio Perm												
v/c Ratio		0.43									0.50	
Uniform Delay, d1		6.8									34.9	
Progression Factor		0.86									1.00	
Incremental Delay, d2		0.1									1.4	
Delay (s)		6.0									36.3	
Level of Service		A									D	
Approach Delay (s)		6.0			0.0			0.0			36.3	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	342	284	200	295	194	124	357	395	160	684	643
Average Queue (ft)	220	170	194	274	78	90	219	225	154	459	405
95th Queue (ft)	308	264	232	286	147	152	351	382	182	856	797
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				21	0						
Queuing Penalty (veh)				132	1						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			26	32		13	53		81	2	
Queuing Penalty (veh)			121	126		27	45		84	3	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	177	175	786	779	420	424	364
Average Queue (ft)	111	120	720	692	387	383	235
95th Queue (ft)	155	166	913	987	433	433	342
Link Distance (ft)	263	263	741	741	395	395	395
Upstream Blk Time (%)			72	46	6	5	0
Queuing Penalty (veh)			0	0	32	25	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	846	870	400	367	333	181	182	173	149	156	250	671
Average Queue (ft)	707	834	400	365	263	172	165	161	78	92	148	640
95th Queue (ft)	1134	854	402	376	334	181	177	169	148	156	340	654
Link Distance (ft)	812	812				153	153	153	153	153		623
Upstream Blk Time (%)	8	64				67	65	65	0	1		99
Queuing Penalty (veh)	0	0				330	322	323	2	3		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		3	38	32	0							94
Queuing Penalty (veh)		31	126	104	1							242

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	657	622	98	168	172	138	32
Average Queue (ft)	621	249	11	88	63	15	1
95th Queue (ft)	759	651	60	158	157	66	22
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	63	0		0	0	0	0
Queuing Penalty (veh)	0	0		0	0	0	0
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	156	137	105	101	103	146	400	450	779	781	745	550
Average Queue (ft)	79	56	58	56	59	69	383	449	738	734	625	283
95th Queue (ft)	134	112	93	93	92	111	431	452	806	833	850	511
Link Distance (ft)	153	153	153	153	153	153			727	727	727	
Upstream Blk Time (%)	0	0			0	0			65	52	4	
Queuing Penalty (veh)	2	0			0	0			0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							6	76	92		3	2
Queuing Penalty (veh)							26	315	759		15	9

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>	>
Maximum Queue (ft)	499	548	539	260	242	60
Average Queue (ft)	448	534	438	49	15	4
95th Queue (ft)	567	547	756	300	135	44
Link Distance (ft)	538	538	538	538	538	
Upstream Blk Time (%)	29	99	61	4	0	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						100
Storage Blk Time (%)					1	
Queuing Penalty (veh)					7	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	L	LR	T	T	T
Maximum Queue (ft)	265	212	107	52	70	135	137
Average Queue (ft)	169	98	38	4	4	55	69
95th Queue (ft)	249	206	81	25	33	112	129
Link Distance (ft)	383	383	383	383	141	141	141
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3212

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	395	137	383	477	353	59	196	155	140	192	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96		1.00	1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3932		1728	1900	1652	1652	3199		1745	3493	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3932		1728	1900	1652	1652	3199		1745	3493	
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.96	0.96	0.96	0.76	0.76	0.76
Adj. Flow (vph)	27	425	147	407	507	376	61	204	161	184	253	28
RTOR Reduction (vph)	0	26	0	0	0	245	0	121	0	0	7	0
Lane Group Flow (vph)	0	573	0	407	507	131	61	244	0	184	274	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	2%	1%	3%	0%	2%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		29.9		35.1	35.1	35.1	7.6	24.0		10.0	26.4	
Effective Green, g (s)		29.9		35.1	35.1	35.1	7.6	24.0		10.0	26.4	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.06	0.20		0.08	0.22	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		979		505	555	483	104	639		145	768	
v/s Ratio Prot		c0.15		0.24	c0.27		0.04	0.08		c0.11	c0.08	
v/s Ratio Perm						0.08						
v/c Ratio		0.59		0.81	0.91	0.27	0.59	0.38		1.27	0.36	
Uniform Delay, d1		39.6		39.3	41.0	32.6	54.7	41.6		55.0	39.6	
Progression Factor		1.00		0.89	0.89	1.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9		8.0	17.5	0.3	8.2	1.7		164.2	1.3	
Delay (s)		40.5		42.7	53.9	42.7	62.9	43.3		219.2	40.9	
Level of Service		D		D	D	D	E	D		F	D	
Approach Delay (s)		40.5			47.1			46.1			111.5	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	56.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	693	905	0	950	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3813	3813		3467	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3813	3813		3467	1615
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.88	0.88
Adj. Flow (vph)	0	815	1065	0	1080	381
RTOR Reduction (vph)	0	0	0	0	0	65
Lane Group Flow (vph)	0	815	1065	0	1080	316
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2224	2224		1126	524
v/s Ratio Prot		0.21	c0.28		c0.31	0.20
v/s Ratio Perm						
v/c Ratio		0.37	0.48		0.96	0.60
Uniform Delay, d1		13.2	14.5		39.7	34.0
Progression Factor		0.99	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		17.6	2.0
Delay (s)		13.2	14.6		57.3	35.9
Level of Service		B	B		E	D
Approach Delay (s)		13.2	14.6		51.8	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations	↑↑↑↑↱			↰↰↰	↑↑	↰↰	↑↑↱			↰↰↰	↱
Volume (vph)	1055	248	74	1206	1204	426	508	99	133	340	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.97			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7154			4829	3421	3351	4884			4921	1329
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7154			4829	3421	3351	4884			4921	1329
Peak-hour factor, PHF	0.97	0.97	0.96	0.96	0.96	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1088	256	77	1256	1254	453	540	105	141	362	112
RTOR Reduction (vph)	7	0	0	0	0	0	29	0	0	0	0
Lane Group Flow (vph)	1337	0	0	1333	1254	453	616	0	0	514	101
Heavy Vehicles (%)	1%	1%	0%	2%	2%	1%	0%	1%	0%	0%	1%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1931			1255	1984	435	634			688	186
v/s Ratio Prot	c0.19			c0.28	0.37	c0.14	0.13			c0.10	0.08
v/s Ratio Perm											
v/c Ratio	0.69			1.06	0.63	1.04	0.97			0.75	0.54
Uniform Delay, d1	32.8			37.0	13.9	43.5	43.3			41.3	40.0
Progression Factor	1.00			1.74	0.63	1.00	1.00			0.22	0.20
Incremental Delay, d2	2.1			39.5	1.0	54.3	29.5			5.8	8.6
Delay (s)	34.8			103.9	9.8	97.8	72.8			14.8	16.7
Level of Service	C			F	A	F	E			B	B
Approach Delay (s)	34.8				58.3		83.1			15.1	
Approach LOS	C				E		F			B	

Intersection Summary			
HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	10	49	219	1453	2183	399	97	280	403	389	993
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (prot)			3441	6536	7695	1615		1610	3427	1615	2787
Flt Permitted			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (perm)			3441	6536	7695	1615		1610	3427	1615	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.93	0.93	0.93	0.89	0.89	0.89	0.89
Adj. Flow (vph)	10	51	228	1514	2347	429	104	315	453	437	1116
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	289	1514	2347	487	0	249	519	437	1106
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			481	2222	3078	646		499	1062	500	1560
v/s Ratio Prot			0.08	0.23	c0.31	0.30		0.15	0.15	c0.27	c0.40
v/s Ratio Perm											
v/c Ratio			0.60	0.68	0.76	0.75		0.50	0.49	0.87	0.71
Uniform Delay, d1			40.4	28.3	25.9	25.8		28.2	28.1	32.7	16.1
Progression Factor			1.11	0.58	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			3.3	1.0	1.8	8.0		3.5	1.6	18.8	2.8
Delay (s)			48.0	17.5	27.7	33.8		31.7	29.7	51.4	18.8
Level of Service			D	B	C	C		C	C	D	B
Approach Delay (s)				22.4	28.9				28.8		
Approach LOS				C	C				C		

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	851	0	0	0	0	0	0	0	0	578	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6232	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6232	
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	868	0	0	0	0	0	0	0	0	628	225
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	65	0
Lane Group Flow (vph)	0	868	0	0	0	0	0	0	0	0	788	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Parking (#/hr)			0									
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1308	
v/s Ratio Prot		c0.17									c0.13	
v/s Ratio Perm												
v/c Ratio		0.24									0.60	
Uniform Delay, d1		5.8									35.7	
Progression Factor		1.07									1.00	
Incremental Delay, d2		0.1									2.1	
Delay (s)		6.3									37.8	
Level of Service		A									D	
Approach Delay (s)		6.3			0.0			0.0			37.8	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	282	243	200	296	188	116	178	190	158	336	295
Average Queue (ft)	169	121	194	274	70	54	92	73	120	164	125
95th Queue (ft)	247	218	231	285	146	107	150	156	171	373	314
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				21							
Queuing Penalty (veh)				129							
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			22	35		3	19		33	4	
Queuing Penalty (veh)			104	135		3	11		32	6	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	138	152	428	406	339	335	336
Average Queue (ft)	82	95	403	354	265	256	216
95th Queue (ft)	129	139	416	513	334	326	320
Link Distance (ft)	263	263	386	386	395	395	395
Upstream Blk Time (%)			86	19			0
Queuing Penalty (veh)			0	0			1
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	836	855	400	367	333	176	179	172	109	117	250	650
Average Queue (ft)	499	756	395	347	228	171	164	159	34	48	165	638
95th Queue (ft)	1079	1002	434	407	333	180	175	166	86	94	348	644
Link Distance (ft)	812	812				153	153	153	153	153		623
Upstream Blk Time (%)	5	48				67	65	65	0	0		98
Queuing Penalty (veh)	0	0				332	323	324	0	0		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		3	22	12	0							95
Queuing Penalty (veh)		29	47	26	0							202

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	638	628	152	175	176	145	25
Average Queue (ft)	634	321	35	107	80	36	1
95th Queue (ft)	645	723	115	170	170	116	14
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	67	0		1	0	0	
Queuing Penalty (veh)	0	0		1	0	0	
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

No Build (2023) Conditions

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	162	143	99	107	187	104	400	450	1209	1208	1208	400
Average Queue (ft)	84	62	59	53	59	64	391	449	1206	1206	1169	134
95th Queue (ft)	140	119	92	91	125	94	415	450	1249	1261	1389	270
Link Distance (ft)	153	153	153	153	153	153			1193	1193	1193	
Upstream Blk Time (%)	1	0		0					88	64	14	
Queuing Penalty (veh)	2	0		0					0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							6	88	96		0	
Queuing Penalty (veh)							25	382	839		1	

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>	>
Maximum Queue (ft)	508	542	314	284	317	60
Average Queue (ft)	504	537	311	117	17	2
95th Queue (ft)	580	551	731	482	163	30
Link Distance (ft)	538	538	538	538	538	
Upstream Blk Time (%)	60	99	39	20	1	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						100
Storage Blk Time (%)					2	
Queuing Penalty (veh)					9	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	29	92	104	301	247	150	37
Average Queue (ft)	1	33	49	209	135	58	4
95th Queue (ft)	17	78	92	298	239	117	22
Link Distance (ft)	150	150	150	293	293	293	293
Upstream Blk Time (%)				1			
Queuing Penalty (veh)				0			
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 2964

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	534	98	409	493	445	88	434	268	184	232	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3533	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	580	107	445	536	484	96	472	291	200	252	29
RTOR Reduction (vph)	0	11	0	0	0	298	0	78	0	0	7	0
Lane Group Flow (vph)	0	726	0	445	536	186	96	685	0	200	274	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Effective Green, g (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.08	0.20		0.08	0.20	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		973		494	554	484	134	655		145	718	
v/s Ratio Prot		c0.19		0.26	c0.28		0.06	c0.21		c0.11	0.08	
v/s Ratio Perm						0.11						
v/c Ratio		0.75		0.90	0.97	0.38	0.72	1.05		1.38	0.38	
Uniform Delay, d1		41.5		40.8	41.9	33.9	53.9	48.0		55.0	41.3	
Progression Factor		1.00		0.91	0.91	1.25	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1		17.1	27.1	0.4	16.6	47.5		207.8	1.5	
Delay (s)		44.6		54.3	65.3	42.8	70.5	95.5		262.8	42.8	
Level of Service		D		D	E	D	E	F		F	D	
Approach Delay (s)		44.6			54.5			92.7			134.3	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	72.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	995	966	0	1303	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1082	1050	0	1416	420
RTOR Reduction (vph)	0	0	0	0	0	68
Lane Group Flow (vph)	0	1082	1050	0	1416	353
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2246	2224		1115	519
v/s Ratio Prot		c0.28	0.28		c0.41	0.22
v/s Ratio Perm						
v/c Ratio		0.48	0.47		1.27	0.68
Uniform Delay, d1		14.5	14.4		40.5	35.1
Progression Factor		0.96	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		128.7	3.5
Delay (s)		13.9	14.5		169.2	38.6
Level of Service		B	B		F	D
Approach Delay (s)		13.9	14.5		139.3	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	72.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1863	169	100	1136	1665	593	483	71	144	323	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.99			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7207			4788	3421	3286	4857			4874	1316
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7207			4788	3421	3286	4857			4874	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2025	184	109	1235	1810	645	525	77	157	351	92
RTOR Reduction (vph)	8	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	2201	0	0	1344	1810	645	583	0	0	517	83
Heavy Vehicles (%)	2%	1%	0%	3%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1945			1244	1984	427	631			682	184
v/s Ratio Prot	c0.31			c0.28	0.53	c0.20	0.12			c0.11	0.06
v/s Ratio Perm											
v/c Ratio	1.13			1.08	0.91	1.51	0.92			0.76	0.45
Uniform Delay, d1	36.5			37.0	18.7	43.5	43.0			41.4	39.5
Progression Factor	1.00			1.63	1.03	1.00	1.00			0.23	0.20
Incremental Delay, d2	66.3			42.6	3.4	241.6	21.3			6.7	6.7
Delay (s)	102.8			102.8	22.8	285.1	64.3			16.1	14.5
Level of Service	F			F	C	F	E			B	B
Approach Delay (s)	102.8				56.9		178.5			15.9	
Approach LOS	F				E		F			B	

Intersection Summary			
HCM 2000 Control Delay	88.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	74	258	2386	2489	590	76	479	1023	613	1223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3478	6408	7471	1615		1610	3383	1599	2733
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3478	6408	7471	1615		1610	3383	1599	2733
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	80	280	2593	2705	641	83	521	1112	666	1329
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	364	2593	2705	678	0	469	1164	666	1319
Heavy Vehicles (%)	2%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			486	2178	2988	646		499	1048	495	1530
v/s Ratio Prot			0.10	c0.40	0.36	c0.42		0.29	0.34	c0.42	c0.48
v/s Ratio Perm											
v/c Ratio			0.75	1.19	0.91	1.05		0.94	1.11	1.35	0.86
Uniform Delay, d1			41.3	33.0	28.2	30.0		33.6	34.5	34.5	18.7
Progression Factor			1.12	0.52	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			1.0	86.2	5.1	49.3		27.8	63.4	168.5	6.7
Delay (s)			47.1	103.4	33.4	79.3		61.4	97.9	203.0	25.4
Level of Service			D	F	C	E		E	F	F	C
Approach Delay (s)				96.5	43.1				85.9		
Approach LOS				F	D				F		

Intersection Summary			
HCM 2000 Control Delay	74.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	1574	0	0	0	0	0	0	0	0	529	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6305	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1711	0	0	0	0	0	0	0	0	575	177
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	1711	0	0	0	0	0	0	0	0	721	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1324	
v/s Ratio Prot		c0.33									c0.11	
v/s Ratio Perm												
v/c Ratio		0.48									0.54	
Uniform Delay, d1		7.2									35.2	
Progression Factor		1.10									1.00	
Incremental Delay, d2		0.0									1.6	
Delay (s)		7.9									36.8	
Level of Service		A									D	
Approach Delay (s)		7.9			0.0			0.0			36.8	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	352	330	200	297	184	124	403	406	160	838	817
Average Queue (ft)	225	176	195	274	79	93	246	265	159	618	568
95th Queue (ft)	315	280	222	288	151	152	374	398	162	1053	1014
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				19						6	2
Queuing Penalty (veh)				125						0	0
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			25	28		16	59		93	1	
Queuing Penalty (veh)			124	115		34	52		108	2	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	184	192	876	868	420	436	356
Average Queue (ft)	113	130	813	784	398	394	214
95th Queue (ft)	162	176	983	1060	433	437	324
Link Distance (ft)	263	263	831	831	395	395	395
Upstream Blk Time (%)			72	44	10	8	0
Queuing Penalty (veh)			0	0	57	46	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	1128	1135	400	367	332	188	182	179	157	172	250	668
Average Queue (ft)	1086	1112	400	364	272	172	165	161	90	100	131	641
95th Queue (ft)	1287	1129	402	378	345	184	177	170	164	166	326	655
Link Distance (ft)	1091	1091				153	153	153	153	153		623
Upstream Blk Time (%)	16	81				67	65	65	2	2		99
Queuing Penalty (veh)	0	0				397	385	388	9	9		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		3	43	41	1							94
Queuing Penalty (veh)		37	159	153	2							279

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	649	623	125	167	162	123	52
Average Queue (ft)	624	234	13	85	54	24	3
95th Queue (ft)	742	619	67	155	137	82	28
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	71	0		0	0	0	
Queuing Penalty (veh)	0	0		0	0	0	
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	146	125	110	111	176	124	400	450	1258	1258	1238	550
Average Queue (ft)	69	49	61	59	63	67	384	449	1222	1222	1202	368
95th Queue (ft)	123	105	95	97	112	105	424	452	1259	1241	1309	655
Link Distance (ft)	153	153	153	153	153	153			1201	1201	1201	
Upstream Blk Time (%)	0	0			0	0			69	52	20	
Queuing Penalty (veh)	1	0			0	0			0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							7	78	90		10	9
Queuing Penalty (veh)							33	387	896		65	44

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>	>
Maximum Queue (ft)	538	553	553	375	388	119
Average Queue (ft)	513	542	461	108	35	7
95th Queue (ft)	577	556	768	444	205	59
Link Distance (ft)	538	538	538	538	538	
Upstream Blk Time (%)	61	100	69	13	0	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						100
Storage Blk Time (%)					3	
Queuing Penalty (veh)					16	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	89	136	130	251	205	116	52
Average Queue (ft)	7	71	86	149	96	41	11
95th Queue (ft)	47	125	136	231	186	87	38
Link Distance (ft)	150	150	150	1016	1016	1016	1016
Upstream Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3924

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	417	144	403	501	380	62	206	163	151	211	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96		1.00	1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3932		1728	1900	1652	1652	3198		1745	3495	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3932		1728	1900	1652	1652	3198		1745	3495	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	453	157	438	545	413	67	224	177	164	229	24
RTOR Reduction (vph)	0	26	0	0	0	250	0	121	0	0	6	0
Lane Group Flow (vph)	0	612	0	438	545	163	67	280	0	164	247	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	2%	1%	3%	0%	2%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	7.7	24.0		10.0	26.3	
Effective Green, g (s)		30.0		35.0	35.0	35.0	7.7	24.0		10.0	26.3	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.06	0.20		0.08	0.22	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		983		504	554	481	106	639		145	765	
v/s Ratio Prot		c0.16		0.25	c0.29		0.04	c0.09		c0.09	0.07	
v/s Ratio Perm						0.10						
v/c Ratio		0.62		0.87	0.98	0.34	0.63	0.44		1.13	0.32	
Uniform Delay, d1		40.0		40.3	42.2	33.4	54.8	42.1		55.0	39.4	
Progression Factor		1.00		0.89	0.90	1.15	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2		13.1	31.3	0.4	11.7	2.2		114.3	1.1	
Delay (s)		41.2		49.1	69.2	38.9	66.4	44.3		169.3	40.5	
Level of Service		D		D	E	D	E	D		F	D	
Approach Delay (s)		41.2			53.9			47.4			91.1	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	743	960	0	1076	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3813	3813		3467	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3813	3813		3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	808	1043	0	1170	383
RTOR Reduction (vph)	0	0	0	0	0	69
Lane Group Flow (vph)	0	808	1043	0	1170	314
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2224	2224		1126	524
v/s Ratio Prot		0.21	c0.27		c0.34	0.19
v/s Ratio Perm						
v/c Ratio		0.36	0.47		1.04	0.60
Uniform Delay, d1		13.2	14.3		40.5	34.0
Progression Factor		0.90	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		37.5	1.9
Delay (s)		12.0	14.5		78.0	35.8
Level of Service		B	B		E	D
Approach Delay (s)		12.0	14.5		67.6	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1205	265	101	1319	1347	479	544	104	140	364	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.97			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7166			4831	3421	3351	4886			4921	1329
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7166			4831	3421	3351	4886			4921	1329
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1310	288	110	1434	1464	521	591	113	152	396	120
RTOR Reduction (vph)	5	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	1593	0	0	1544	1464	521	676	0	0	560	108
Heavy Vehicles (%)	1%	1%	0%	2%	2%	1%	0%	1%	0%	0%	1%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1934			1256	1984	435	635			688	186
v/s Ratio Prot	c0.22			c0.32	0.43	c0.16	0.14			c0.11	0.08
v/s Ratio Perm											
v/c Ratio	0.82			1.23	0.74	1.20	1.06			0.81	0.58
Uniform Delay, d1	34.3			37.0	15.4	43.5	43.5			41.7	40.3
Progression Factor	1.00			1.69	0.82	1.00	1.00			0.21	0.19
Incremental Delay, d2	4.1			107.3	1.4	109.4	54.2			7.8	9.5
Delay (s)	38.4			170.0	14.1	152.9	97.7			16.6	17.2
Level of Service	D			F	B	F	F			B	B
Approach Delay (s)	38.4				94.2		121.2			16.7	
Approach LOS	D				F		F			B	

Intersection Summary			
HCM 2000 Control Delay	77.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	11	52	230	1677	2411	446	103	333	436	416	1059
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (prot)			3440	6536	7695	1615		1610	3419	1615	2787
Flt Permitted			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (perm)			3440	6536	7695	1615		1610	3419	1615	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	57	250	1823	2621	485	112	362	474	452	1151
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	319	1823	2621	551	0	271	565	452	1141
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			481	2222	3078	646		499	1059	500	1560
v/s Ratio Prot			0.09	0.28	0.34	c0.34		0.17	0.17	c0.28	c0.41
v/s Ratio Perm											
v/c Ratio			0.66	0.82	0.85	0.85		0.54	0.53	0.90	0.73
Uniform Delay, d1			40.8	30.2	27.3	27.3		28.6	28.5	33.1	16.4
Progression Factor			1.10	0.56	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			2.8	1.4	3.2	13.5		4.2	1.9	22.3	3.1
Delay (s)			47.5	18.2	30.5	40.8		32.8	30.4	55.4	19.5
Level of Service			D	B	C	D		C	C	E	B
Approach Delay (s)				22.6	32.4				30.2		
Approach LOS				C	C				C		

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	934	0	0	0	0	0	0	0	0	615	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6233	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6233	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1015	0	0	0	0	0	0	0	0	668	237
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	64	0
Lane Group Flow (vph)	0	1015	0	0	0	0	0	0	0	0	841	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Parking (#/hr)			0									
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1308	
v/s Ratio Prot		c0.20									c0.13	
v/s Ratio Perm												
v/c Ratio		0.29									0.64	
Uniform Delay, d1		6.0									36.1	
Progression Factor		1.19									1.00	
Incremental Delay, d2		0.1									2.4	
Delay (s)		7.2									38.5	
Level of Service		A									D	
Approach Delay (s)		7.2			0.0			0.0			38.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	268	256	200	293	173	124	193	201	160	426	379
Average Queue (ft)	169	136	188	273	66	55	100	78	136	236	183
95th Queue (ft)	241	227	247	288	138	108	167	170	188	554	497
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				22	1						
Queuing Penalty (veh)				142	3						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			23	36		4	20		51	3	
Queuing Penalty (veh)			116	145		4	13		54	4	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	148	157	993	972	420	424	362
Average Queue (ft)	86	96	906	885	377	372	237
95th Queue (ft)	130	141	1194	1249	447	446	338
Link Distance (ft)	263	263	947	947	395	395	395
Upstream Blk Time (%)			77	47	6	4	0
Queuing Penalty (veh)			0	0	26	20	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	1530	1544	400	367	333	176	175	174	113	105	250	661
Average Queue (ft)	1459	1501	400	360	259	171	163	159	38	52	169	639
95th Queue (ft)	1836	1663	400	394	346	181	173	167	98	97	351	648
Link Distance (ft)	1504	1504				153	153	153	153	153		623
Upstream Blk Time (%)	11	84				67	65	65	0			97
Queuing Penalty (veh)	0	0				371	359	360	0			0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		4	31	27	0						0	95
Queuing Penalty (veh)		37	74	64	1						0	227

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	649	626	166	183	199	166	92
Average Queue (ft)	628	310	34	131	109	64	7
95th Queue (ft)	713	703	117	195	195	160	49
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	65	0		1	0	0	0
Queuing Penalty (veh)	0	0		2	1	0	0
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	138	132	94	106	196	172	400	450	1132	1132	1132	383
Average Queue (ft)	71	56	64	57	66	68	391	449	1132	1132	1103	152
95th Queue (ft)	123	113	93	92	137	119	414	451	1134	1132	1231	286
Link Distance (ft)	153	153	153	153	153	153			1117	1117	1117	
Upstream Blk Time (%)	0	0							89	62	12	
Queuing Penalty (veh)	0	0							0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							6	88	96		0	
Queuing Penalty (veh)							31	422	924		2	

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB
Directions Served	L	LT	T	>
Maximum Queue (ft)	488	534	418	20
Average Queue (ft)	488	534	418	1
95th Queue (ft)	648	538	764	14
Link Distance (ft)	538	538	538	538
Upstream Blk Time (%)	80	100	60	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				0
Queuing Penalty (veh)				1

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	53	81	102	274	261	161	56
Average Queue (ft)	4	29	47	226	159	71	7
95th Queue (ft)	30	71	94	306	263	142	37
Link Distance (ft)	150	150	150	255	255	255	255
Upstream Blk Time (%)				9	1		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3403

Build (2023) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	534	98	409	493	452	88	434	268	191	232	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3533	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	580	107	445	536	491	96	472	291	208	252	29
RTOR Reduction (vph)	0	11	0	0	0	302	0	78	0	0	7	0
Lane Group Flow (vph)	0	726	0	445	536	189	96	685	0	208	274	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Effective Green, g (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.08	0.20		0.08	0.20	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		973		494	554	484	134	655		145	718	
v/s Ratio Prot		c0.19		0.26	c0.28		0.06	c0.21		c0.12	0.08	
v/s Ratio Perm						0.11						
v/c Ratio		0.75		0.90	0.97	0.39	0.72	1.05		1.43	0.38	
Uniform Delay, d1		41.5		40.8	41.9	34.0	53.9	48.0		55.0	41.3	
Progression Factor		1.00		0.91	0.91	1.25	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1		17.1	27.0	0.4	16.6	47.5		230.3	1.5	
Delay (s)		44.6		54.2	65.2	42.7	70.5	95.5		285.3	42.8	
Level of Service		D		D	E	D	E	F		F	D	
Approach Delay (s)		44.6			54.4			92.7			146.0	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	74.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰↰	↱
Volume (vph)	0	1002	973	0	1405	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1089	1058	0	1527	420
RTOR Reduction (vph)	0	0	0	0	0	66
Lane Group Flow (vph)	0	1089	1058	0	1527	354
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2246	2224		1115	519
v/s Ratio Prot		c0.28	0.28		c0.44	0.22
v/s Ratio Perm						
v/c Ratio		0.48	0.48		1.37	0.68
Uniform Delay, d1		14.5	14.4		40.5	35.1
Progression Factor		0.98	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		172.1	3.7
Delay (s)		14.3	14.6		212.6	38.8
Level of Service		B	B		F	D
Approach Delay (s)		14.3	14.6		175.1	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	90.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1972	169	100	1136	1705	600	483	71	144	323	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.99			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7212			4788	3421	3286	4857			4874	1316
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7212			4788	3421	3286	4857			4874	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2143	184	109	1235	1853	652	525	77	157	351	92
RTOR Reduction (vph)	8	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	2319	0	0	1344	1853	652	583	0	0	517	83
Heavy Vehicles (%)	2%	1%	0%	3%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1947			1244	1984	427	631			682	184
v/s Ratio Prot	c0.32			c0.28	0.54	c0.20	0.12			c0.11	0.06
v/s Ratio Perm											
v/c Ratio	1.19			1.08	0.93	1.53	0.92			0.76	0.45
Uniform Delay, d1	36.5			37.0	19.2	43.5	43.0			41.4	39.5
Progression Factor	1.00			1.62	1.06	1.00	1.00			0.23	0.20
Incremental Delay, d2	91.4			42.3	4.2	248.8	21.3			6.7	6.7
Delay (s)	127.9			102.4	24.5	292.3	64.3			16.1	14.5
Level of Service	F			F	C	F	E			B	B
Approach Delay (s)	127.9				57.2		182.8			15.8	
Approach LOS	F				E		F			B	

Intersection Summary			
HCM 2000 Control Delay	97.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	74	258	2502	2529	597	76	479	1023	613	1223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3478	6408	7471	1615		1610	3383	1599	2733
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3478	6408	7471	1615		1610	3383	1599	2733
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	80	280	2720	2749	649	83	521	1112	666	1329
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	364	2720	2749	686	0	469	1164	666	1319
Heavy Vehicles (%)	2%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			486	2178	2988	646		499	1048	495	1530
v/s Ratio Prot			0.10	c0.42	0.37	c0.43		0.29	0.34	c0.42	c0.48
v/s Ratio Perm											
v/c Ratio			0.75	1.25	0.92	1.06		0.94	1.11	1.35	0.86
Uniform Delay, d1			41.3	33.0	28.5	30.0		33.6	34.5	34.5	18.7
Progression Factor			1.12	0.53	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			1.0	112.4	5.9	53.2		27.8	63.4	168.5	6.7
Delay (s)			47.4	129.8	34.4	83.2		61.4	97.9	203.0	25.4
Level of Service			D	F	C	F		E	F	F	C
Approach Delay (s)				120.0	44.7				85.9		
Approach LOS				F	D				F		

Intersection Summary			
HCM 2000 Control Delay	82.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	1581	0	0	0	0	0	0	0	0	529	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6305	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1718	0	0	0	0	0	0	0	0	575	177
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	1718	0	0	0	0	0	0	0	0	722	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1324	
v/s Ratio Prot		c0.33									c0.11	
v/s Ratio Perm												
v/c Ratio		0.48									0.55	
Uniform Delay, d1		7.2									35.2	
Progression Factor		1.11									1.00	
Incremental Delay, d2		0.0									1.6	
Delay (s)		8.0									36.9	
Level of Service		A									D	
Approach Delay (s)		8.0			0.0			0.0			36.9	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	355	323	200	296	191	124	424	449	160	1005	969
Average Queue (ft)	227	185	195	273	83	98	248	265	159	693	640
95th Queue (ft)	318	289	229	286	156	152	397	418	162	1114	1063
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				18						7	1
Queuing Penalty (veh)				124						0	0
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			24	29		16	56		93	1	
Queuing Penalty (veh)			119	118		35	50		108	2	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	193	212	828	809	424	429	318
Average Queue (ft)	116	129	790	775	399	394	196
95th Queue (ft)	170	180	905	956	426	428	282
Link Distance (ft)	263	263	788	788	395	395	395
Upstream Blk Time (%)			80	47	10	8	
Queuing Penalty (veh)			0	0	58	47	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	1744	1756	400	367	332	180	182	170	155	158	250	669
Average Queue (ft)	1717	1725	400	366	277	173	165	159	90	104	127	642
95th Queue (ft)	1734	1745	403	369	348	180	176	166	162	162	323	654
Link Distance (ft)	1702	1702				153	153	153	153	153		624
Upstream Blk Time (%)	25	93				67	65	65	1	1		99
Queuing Penalty (veh)	0	0				404	394	393	8	6		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		3	43	43	1							95
Queuing Penalty (veh)		41	168	170	2							284

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	660	620	108	182	176	152	41
Average Queue (ft)	627	264	7	113	81	30	2
95th Queue (ft)	745	660	49	178	170	103	25
Link Distance (ft)	624	624		162	162	162	162
Upstream Blk Time (%)	66	0		1	0	0	
Queuing Penalty (veh)	0	0		1	0	0	
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	151	132	114	120	108	123	400	450	1152	1160	1144	550
Average Queue (ft)	65	46	63	60	59	70	389	449	1125	1125	1099	372
95th Queue (ft)	113	94	100	98	97	108	419	449	1143	1143	1206	659
Link Distance (ft)	153	153	153	153	153	153			1105	1105	1105	
Upstream Blk Time (%)	0	0	0	0	0	0			69	54	15	
Queuing Penalty (veh)	1	0	0	0	0	0			0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							8	82	94		9	8
Queuing Penalty (veh)							39	415	949		63	43

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>	>
Maximum Queue (ft)	551	556	548	328	366	90
Average Queue (ft)	500	545	314	29	21	5
95th Queue (ft)	646	562	749	201	167	49
Link Distance (ft)	538	538	538	538	538	
Upstream Blk Time (%)	79	97	52	1	0	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						100
Storage Blk Time (%)					2	
Queuing Penalty (veh)					12	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	65	135	138	288	244	125	34
Average Queue (ft)	4	73	87	200	122	46	2
95th Queue (ft)	34	128	138	300	231	96	17
Link Distance (ft)	150	150	150	273	273	273	273
Upstream Blk Time (%)		0	0	2	0		
Queuing Penalty (veh)		0	0	0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 4054

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	417	144	403	501	388	62	206	163	160	211	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96		1.00	1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3932		1728	1900	1652	1652	3198		1745	3495	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3932		1728	1900	1652	1652	3198		1745	3495	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	453	157	438	545	422	67	224	177	174	229	24
RTOR Reduction (vph)	0	26	0	0	0	256	0	121	0	0	6	0
Lane Group Flow (vph)	0	612	0	438	545	166	67	280	0	174	247	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	2%	1%	3%	0%	2%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	7.7	24.0		10.0	26.3	
Effective Green, g (s)		30.0		35.0	35.0	35.0	7.7	24.0		10.0	26.3	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.06	0.20		0.08	0.22	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		983		504	554	481	106	639		145	765	
v/s Ratio Prot		c0.16		0.25	c0.29		0.04	c0.09		c0.10	0.07	
v/s Ratio Perm						0.10						
v/c Ratio		0.62		0.87	0.98	0.35	0.63	0.44		1.20	0.32	
Uniform Delay, d1		40.0		40.3	42.2	33.5	54.8	42.1		55.0	39.4	
Progression Factor		1.00		0.89	0.89	1.16	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2		13.1	31.3	0.4	11.7	2.2		138.4	1.1	
Delay (s)		41.2		49.0	69.1	39.3	66.4	44.3		193.4	40.5	
Level of Service		D		D	E	D	E	D		F	D	
Approach Delay (s)		41.2			53.9			47.4			102.8	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	57.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰↰	↱
Volume (vph)	0	752	968	0	1198	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3813	3813		3467	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3813	3813		3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	817	1052	0	1302	383
RTOR Reduction (vph)	0	0	0	0	0	68
Lane Group Flow (vph)	0	817	1052	0	1302	316
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2224	2224		1126	524
v/s Ratio Prot		0.21	c0.28		c0.38	0.20
v/s Ratio Perm						
v/c Ratio		0.37	0.47		1.16	0.60
Uniform Delay, d1		13.3	14.4		40.5	34.0
Progression Factor		0.93	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		80.7	2.0
Delay (s)		12.4	14.5		121.2	35.9
Level of Service		B	B		F	D
Approach Delay (s)		12.4	14.5		101.8	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1335	265	101	1358	1394	488	544	104	140	364	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.98			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7182			4831	3421	3351	4886			4921	1329
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7182			4831	3421	3351	4886			4921	1329
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1451	288	110	1476	1515	530	591	113	152	396	120
RTOR Reduction (vph)	5	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	1734	0	0	1586	1515	530	676	0	0	560	108
Heavy Vehicles (%)	1%	1%	0%	2%	2%	1%	0%	1%	0%	0%	1%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1939			1256	1984	435	635			688	186
v/s Ratio Prot	c0.24			c0.33	0.44	c0.16	0.14			c0.11	0.08
v/s Ratio Perm											
v/c Ratio	0.89			1.26	0.76	1.22	1.06			0.81	0.58
Uniform Delay, d1	35.1			37.0	15.8	43.5	43.5			41.7	40.3
Progression Factor	1.00			1.68	0.86	1.00	1.00			0.21	0.19
Incremental Delay, d2	6.9			121.8	1.6	117.6	54.2			7.8	9.5
Delay (s)	42.0			183.9	15.1	161.1	97.7			16.6	17.2
Level of Service	D			F	B	F	F			B	B
Approach Delay (s)	42.0				101.4		124.9			16.7	
Approach LOS	D				F		F			B	

Intersection Summary			
HCM 2000 Control Delay	82.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	11	52	230	1816	2462	454	103	368	436	416	1059
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (prot)			3440	6536	7695	1615		1610	3411	1615	2787
Flt Permitted			0.95	1.00	1.00	1.00		0.95	0.99	1.00	1.00
Satd. Flow (perm)			3440	6536	7695	1615		1610	3411	1615	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	57	250	1974	2676	493	112	400	474	452	1151
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	319	1974	2676	559	0	284	590	452	1141
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			481	2222	3078	646		499	1057	500	1560
v/s Ratio Prot			0.09	0.30	c0.35	0.35		0.18	0.17	c0.28	c0.41
v/s Ratio Perm											
v/c Ratio			0.66	0.89	0.87	0.87		0.57	0.56	0.90	0.73
Uniform Delay, d1			40.8	31.2	27.6	27.5		28.9	28.8	33.1	16.4
Progression Factor			1.10	0.54	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			2.2	1.9	3.7	14.5		4.7	2.1	22.3	3.1
Delay (s)			47.2	18.7	31.3	42.0		33.6	30.9	55.4	19.5
Level of Service			D	B	C	D		C	C	E	B
Approach Delay (s)				22.6	33.3				30.4		
Approach LOS				C	C				C		

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	942	0	0	0	0	0	0	0	0	615	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6233	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6233	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1024	0	0	0	0	0	0	0	0	668	237
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	64	0
Lane Group Flow (vph)	0	1024	0	0	0	0	0	0	0	0	841	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Parking (#/hr)			0									
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1308	
v/s Ratio Prot		c0.20									c0.13	
v/s Ratio Perm												
v/c Ratio		0.29									0.64	
Uniform Delay, d1		6.0									36.1	
Progression Factor		1.18									1.00	
Incremental Delay, d2		0.1									2.4	
Delay (s)		7.2									38.5	
Level of Service		A									D	
Approach Delay (s)		7.2			0.0			0.0			38.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	282	262	200	294	220	124	156	184	160	608	564
Average Queue (ft)	175	135	194	274	74	66	101	79	151	341	276
95th Queue (ft)	250	232	228	285	155	123	157	167	183	651	602
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				19	0						
Queuing Penalty (veh)				123	1						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			25	30		6	21		76	1	
Queuing Penalty (veh)			125	123		6	13		80	2	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	155	155	837	831	426	424	317
Average Queue (ft)	95	102	766	742	398	394	205
95th Queue (ft)	139	140	952	1031	430	426	291
Link Distance (ft)	263	263	788	788	395	395	395
Upstream Blk Time (%)			77	48	9	7	
Queuing Penalty (veh)			0	0	49	36	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	840	862	400	367	333	177	183	174	120	124	250	664
Average Queue (ft)	671	829	400	359	265	172	164	159	41	53	172	639
95th Queue (ft)	1144	841	400	391	358	180	176	167	101	107	352	650
Link Distance (ft)	812	812				153	153	153	153	153		623
Upstream Blk Time (%)	7	69				68	66	65	0	0		98
Queuing Penalty (veh)	0	0				384	373	371	0	0		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		5	33	25	0						0	95
Queuing Penalty (veh)		53	87	68	1						0	233

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	640	625	141	182	193	161	73
Average Queue (ft)	630	357	32	126	108	54	5
95th Queue (ft)	713	749	109	185	189	140	40
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	63	0		1	1	0	0
Queuing Penalty (veh)	0	0		2	1	0	0
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	144	130	92	95	232	111	400	450	1196	1196	1196	389
Average Queue (ft)	74	49	61	54	62	64	390	449	1196	1196	1154	135
95th Queue (ft)	123	100	94	84	128	98	414	451	1199	1196	1368	280
Link Distance (ft)	153	153	153	153	153	153			1181	1181	1181	
Upstream Blk Time (%)	0	0							89	65	11	
Queuing Penalty (veh)	1	0							0	0	0	
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							6	87	95		1	
Queuing Penalty (veh)							32	428	939		5	

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>
Maximum Queue (ft)	468	543	326	111	78
Average Queue (ft)	468	538	321	4	3
95th Queue (ft)	582	550	753	78	55
Link Distance (ft)	538	538	538	538	538
Upstream Blk Time (%)	40	100	60	0	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	27	100	101	242	233	166	85
Average Queue (ft)	1	34	47	214	150	67	8
95th Queue (ft)	13	81	94	273	235	134	44
Link Distance (ft)	150	150	150	227	227	227	227
Upstream Blk Time (%)				13	1		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3537

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	534	98	409	493	449	88	434	268	188	232	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3533	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	580	107	445	536	488	96	472	291	204	252	29
RTOR Reduction (vph)	0	11	0	0	0	300	0	78	0	0	7	0
Lane Group Flow (vph)	0	726	0	445	536	188	96	685	0	204	274	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Effective Green, g (s)		30.0		35.0	35.0	35.0	9.6	24.0		10.0	24.4	
Actuated g/C Ratio		0.25		0.29	0.29	0.29	0.08	0.20		0.08	0.20	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		973		494	554	484	134	655		145	718	
v/s Ratio Prot		c0.19		0.26	c0.28		0.06	c0.21		c0.12	0.08	
v/s Ratio Perm						0.11						
v/c Ratio		0.75		0.90	0.97	0.39	0.72	1.05		1.41	0.38	
Uniform Delay, d1		41.5		40.8	41.9	33.9	53.9	48.0		55.0	41.3	
Progression Factor		1.00		0.91	0.91	1.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1		17.1	27.1	0.4	16.6	47.5		219.0	1.5	
Delay (s)		44.6		54.2	65.3	42.7	70.5	95.5		274.0	42.8	
Level of Service		D		D	E	D	E	F		F	D	
Approach Delay (s)		44.6			54.4			92.7			140.1	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	73.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	999	970	0	1361	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1086	1054	0	1479	420
RTOR Reduction (vph)	0	0	0	0	0	67
Lane Group Flow (vph)	0	1086	1054	0	1479	353
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		70.0	70.0		39.0	39.0
Effective Green, g (s)		70.0	70.0		39.0	39.0
Actuated g/C Ratio		0.58	0.58		0.32	0.32
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		2246	2224		1115	519
v/s Ratio Prot		c0.28	0.28		c0.43	0.22
v/s Ratio Perm						
v/c Ratio		0.48	0.47		1.33	0.68
Uniform Delay, d1		14.5	14.4		40.5	35.1
Progression Factor		0.97	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.2		153.2	3.7
Delay (s)		14.1	14.6		193.7	38.8
Level of Service		B	B		F	D
Approach Delay (s)		14.1	14.6		159.4	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	82.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1925	169	100	1136	1688	597	483	71	144	323	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor	0.81			0.94	0.95	0.97	0.91			0.94	0.86
Frt	0.99			1.00	1.00	1.00	0.98			1.00	0.85
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	7210			4788	3421	3286	4857			4874	1316
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	7210			4788	3421	3286	4857			4874	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2092	184	109	1235	1835	649	525	77	157	351	92
RTOR Reduction (vph)	8	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	2268	0	0	1344	1835	649	583	0	0	517	83
Heavy Vehicles (%)	2%	1%	0%	3%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	Prot
Protected Phases	2		1	1	6	7	7		4	4	4
Permitted Phases											
Actuated Green, G (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Effective Green, g (s)	27.0			26.0	58.0	13.0	13.0			14.0	14.0
Actuated g/C Ratio	0.27			0.26	0.58	0.13	0.13			0.14	0.14
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	1946			1244	1984	427	631			682	184
v/s Ratio Prot	c0.31			c0.28	0.54	c0.20	0.12			c0.11	0.06
v/s Ratio Perm											
v/c Ratio	1.17			1.08	0.92	1.52	0.92			0.76	0.45
Uniform Delay, d1	36.5			37.0	19.0	43.5	43.0			41.4	39.5
Progression Factor	1.00			1.62	1.05	1.00	1.00			0.23	0.20
Incremental Delay, d2	80.5			42.5	3.8	245.7	21.3			6.7	6.7
Delay (s)	117.0			102.6	23.8	289.2	64.3			16.1	14.5
Level of Service	F			F	C	F	E			B	B
Approach Delay (s)	117.0				57.1		181.0			15.8	
Approach LOS	F				E		F			B	

Intersection Summary			
HCM 2000 Control Delay	93.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	74	258	2452	2512	594	76	479	1023	613	1223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.91	0.91	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	0.85	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3478	6408	7471	1615		1610	3383	1599	2733
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3478	6408	7471	1615		1610	3383	1599	2733
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	80	280	2665	2730	646	83	521	1112	666	1329
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	10
Lane Group Flow (vph)	0	0	364	2665	2730	683	0	469	1164	666	1319
Heavy Vehicles (%)	2%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6	6		8	8	8	1 8
Permitted Phases											
Actuated Green, G (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Effective Green, g (s)			14.0	34.0	40.0	40.0		31.0	31.0	31.0	56.0
Actuated g/C Ratio			0.14	0.34	0.40	0.40		0.31	0.31	0.31	0.56
Clearance Time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	
Lane Grp Cap (vph)			486	2178	2988	646		499	1048	495	1530
v/s Ratio Prot			0.10	c0.42	0.37	c0.42		0.29	0.34	c0.42	c0.48
v/s Ratio Perm											
v/c Ratio			0.75	1.22	0.91	1.06		0.94	1.11	1.35	0.86
Uniform Delay, d1			41.3	33.0	28.4	30.0		33.6	34.5	34.5	18.7
Progression Factor			1.12	0.53	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			1.0	101.0	5.6	51.7		27.8	63.4	168.5	6.7
Delay (s)			47.2	118.4	33.9	81.7		61.4	97.9	203.0	25.4
Level of Service			D	F	C	F		E	F	F	C
Approach Delay (s)				109.8	44.0				85.9		
Approach LOS				F	D				F		

Intersection Summary			
HCM 2000 Control Delay	78.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	1578	0	0	0	0	0	0	0	0	529	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6305	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1715	0	0	0	0	0	0	0	0	575	177
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	1715	0	0	0	0	0	0	0	0	722	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1324	
v/s Ratio Prot		c0.33									c0.11	
v/s Ratio Perm												
v/c Ratio		0.48									0.55	
Uniform Delay, d1		7.2									35.2	
Progression Factor		1.10									1.00	
Incremental Delay, d2		0.0									1.6	
Delay (s)		8.0									36.9	
Level of Service		A									D	
Approach Delay (s)		8.0			0.0			0.0			36.9	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	368	313	200	298	223	124	411	423	160	751	707
Average Queue (ft)	228	184	194	274	94	98	226	245	159	560	504
95th Queue (ft)	326	280	231	290	186	154	354	389	164	922	868
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				18	0						
Queuing Penalty (veh)				123	1						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			24	29		17	55		92	1	
Queuing Penalty (veh)			120	117		36	49		107	1	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	199	203	842	818	414	431	332
Average Queue (ft)	113	124	762	737	384	379	213
95th Queue (ft)	165	174	945	981	445	442	315
Link Distance (ft)	263	263	788	788	395	395	395
Upstream Blk Time (%)			65	40	7	5	0
Queuing Penalty (veh)			0	0	41	30	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	TR	UL	L	L	T	T	L	L
Maximum Queue (ft)	850	870	400	367	333	186	191	189	165	164	250	674
Average Queue (ft)	626	833	400	365	263	172	166	162	106	107	144	643
95th Queue (ft)	1162	852	402	373	338	182	181	175	154	155	340	660
Link Distance (ft)	812	812				153	153	153	153	153		623
Upstream Blk Time (%)	7	61				66	65	65	1	1		99
Queuing Penalty (veh)	0	0				396	389	388	5	4		0
Storage Bay Dist (ft)			300	300	300						200	
Storage Blk Time (%)		2	38	31	0						0	95
Queuing Penalty (veh)		24	148	120	2						0	282

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SW	SW	SW	SW
Directions Served	T	T	TR	<L	L	LR	R
Maximum Queue (ft)	649	618	113	182	185	152	59
Average Queue (ft)	627	256	13	121	96	35	2
95th Queue (ft)	718	649	64	191	188	117	29
Link Distance (ft)	623	623		162	162	162	162
Upstream Blk Time (%)	67	0		1	0	0	0
Queuing Penalty (veh)	0	0		1	1	0	0
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	125	106	97	108	123	118	302	294	308	296	271	270
Average Queue (ft)	65	43	58	58	59	69	272	270	270	262	187	180
95th Queue (ft)	113	92	91	95	95	103	291	294	298	314	317	307
Link Distance (ft)	153	153	153	153	153	153			255	255	255	
Upstream Blk Time (%)	0				0		77	62	55	33	7	11
Queuing Penalty (veh)	0				0		0	0	0	0	0	0
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							77	62	55		7	11
Queuing Penalty (veh)							386	312	552		45	55

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	>	>
Maximum Queue (ft)	553	558	569	535	358	90
Average Queue (ft)	469	544	473	93	31	7
95th Queue (ft)	690	557	767	416	191	59
Link Distance (ft)	538	538	538	538	538	
Upstream Blk Time (%)	59	99	69	4	0	
Queuing Penalty (veh)	0	0	0	0	0	
Storage Bay Dist (ft)						100
Storage Blk Time (%)					3	
Queuing Penalty (veh)					17	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	68	142	166	200	191	152	34
Average Queue (ft)	5	76	107	183	121	50	2
95th Queue (ft)	43	143	157	226	209	111	15
Link Distance (ft)	150	150	150	185	185	185	185
Upstream Blk Time (%)	0	0	1	18	1	0	
Queuing Penalty (veh)	0	0	3	0	0	0	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3756

Build (2023) Mitigated Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	534	98	409	493	452	88	434	268	191	232	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3533	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	580	107	445	536	491	96	472	291	208	252	29
RTOR Reduction (vph)	0	12	0	0	0	302	0	78	0	0	7	0
Lane Group Flow (vph)	0	725	0	445	536	189	96	685	0	208	274	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		21.0		32.0	32.0	32.0	11.1	25.0		21.0	34.9	
Effective Green, g (s)		21.0		32.0	32.0	32.0	11.1	25.0		21.0	34.9	
Actuated g/C Ratio		0.18		0.27	0.27	0.27	0.09	0.21		0.18	0.29	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		681		452	506	443	155	682		305	1027	
v/s Ratio Prot		c0.19		0.26	c0.28		0.06	c0.21		c0.12	0.08	
v/s Ratio Perm						0.11						
v/c Ratio		1.07		0.98	1.06	0.43	0.62	1.00		0.68	0.27	
Uniform Delay, d1		49.5		43.8	44.0	36.4	52.4	47.5		46.4	32.7	
Progression Factor		1.00		0.75	0.75	0.57	1.00	1.00		1.00	1.00	
Incremental Delay, d2		53.2		34.2	53.0	0.5	7.2	35.4		6.2	0.6	
Delay (s)		102.7		67.1	85.9	21.3	59.6	82.9		52.5	33.3	
Level of Service		F		E	F	C	E	F		D	C	
Approach Delay (s)		102.7			58.6			80.3			41.5	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	70.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰↰	↱
Volume (vph)	0	1002	973	0	1405	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1089	1058	0	1527	420
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	0	1089	1058	0	1527	384
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		58.0	58.0		52.0	52.0
Effective Green, g (s)		58.0	58.0		46.0	46.0
Actuated g/C Ratio		0.48	0.48		0.38	0.38
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1861	1842		1315	612
v/s Ratio Prot		c0.28	0.28		c0.44	0.24
v/s Ratio Perm						
v/c Ratio		0.59	0.57		1.16	0.63
Uniform Delay, d1		22.3	22.2		37.0	30.0
Progression Factor		1.39	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.4		81.3	2.0
Delay (s)		31.1	22.6		118.3	32.1
Level of Service		C	C		F	C
Approach Delay (s)		31.1	22.6		99.7	
Approach LOS		C	C		F	

Intersection Summary			
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1972	169	100	1136	1705	600	483	71	144	323	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	0.76			0.94	0.91	0.94	0.95			0.91	
Frt	0.99			1.00	1.00	1.00	0.98			0.98	
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	8120			4832	4916	4777	3380			6195	
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	8120			4832	4916	4777	3380			6195	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2143	184	109	1235	1853	652	525	77	157	351	92
RTOR Reduction (vph)	8	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	2319	0	0	1344	1853	652	590	0	0	600	0
Heavy Vehicles (%)	2%	1%	0%	2%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	
Protected Phases	2		1	1	6	7	7		4	4	
Permitted Phases											
Actuated Green, G (s)	27.0			27.0	59.0	17.0	17.0			9.0	
Effective Green, g (s)	27.0			27.0	59.0	17.0	17.0			9.0	
Actuated g/C Ratio	0.27			0.27	0.59	0.17	0.17			0.09	
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Grp Cap (vph)	2192			1304	2900	812	574			557	
v/s Ratio Prot	c0.29			c0.28	0.38	0.14	c0.17			c0.10	
v/s Ratio Perm											
v/c Ratio	1.06			1.03	0.64	0.80	1.03			1.08	
Uniform Delay, d1	36.5			36.5	13.5	39.9	41.5			45.5	
Progression Factor	1.00			0.60	0.40	1.00	1.00			0.91	
Incremental Delay, d2	36.7			25.7	0.5	8.3	45.1			57.9	
Delay (s)	73.2			47.7	5.9	48.2	86.6			99.2	
Level of Service	E			D	A	D	F			F	
Approach Delay (s)	73.2				23.4		66.6			99.2	
Approach LOS	E				C		E			F	

Intersection Summary			
HCM 2000 Control Delay	52.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	74	258	2502	2529	597	76	479	1023	613	1223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.97	0.95	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	1.00	0.88
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3478	6408	7471	1615		3433	3539	1881	2830
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3478	6408	7471	1615		3433	3539	1881	2830
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	80	280	2720	2749	649	83	521	1112	666	1329
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	12
Lane Group Flow (vph)	0	0	364	2720	2749	686	0	521	1112	666	1317
Heavy Vehicles (%)	2%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6 7	6 7		8	8	8	7 8
Permitted Phases											
Actuated Green, G (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Effective Green, g (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Actuated g/C Ratio			0.12	0.44	0.39	0.39		0.34	0.34	0.34	0.46
Clearance Time (s)			5.0	5.0				5.0	5.0	5.0	
Lane Grp Cap (vph)			417	2819	2913	629		1167	1203	639	1301
v/s Ratio Prot			0.10	c0.42	0.37	c0.42		0.15	0.31	0.35	c0.47
v/s Ratio Perm											
v/c Ratio			0.87	0.96	0.94	1.09		0.45	0.92	1.04	1.01
Uniform Delay, d1			43.3	27.2	29.4	30.5		25.7	31.8	33.0	27.0
Progression Factor			1.35	0.22	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			6.2	3.4	7.9	62.9		1.2	13.2	47.1	28.0
Delay (s)			64.5	9.5	37.3	93.4		26.9	44.9	80.1	55.0
Level of Service			E	A	D	F		C	D	F	E
Approach Delay (s)				16.0	49.1				52.5		
Approach LOS				B	D				D		

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	1581	0	0	0	0	0	0	0	0	529	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6305	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1718	0	0	0	0	0	0	0	0	575	177
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	1718	0	0	0	0	0	0	0	0	722	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1324	
v/s Ratio Prot		c0.33									c0.11	
v/s Ratio Perm												
v/c Ratio		0.48									0.55	
Uniform Delay, d1		7.2									35.2	
Progression Factor		0.59									1.00	
Incremental Delay, d2		0.1									1.6	
Delay (s)		4.4									36.9	
Level of Service		A									D	
Approach Delay (s)		4.4			0.0			0.0			36.9	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	579	583	200	297	274	124	421	433	160	296	271
Average Queue (ft)	447	412	197	273	94	88	239	255	130	135	102
95th Queue (ft)	659	636	212	288	202	159	383	411	176	263	211
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)	14	11		43	0						
Queuing Penalty (veh)	0	0		294	3						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			35	50		21	58		28	3	
Queuing Penalty (veh)			174	203		45	51		32	5	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	286	325	419	398	331	327	410
Average Queue (ft)	239	261	376	302	149	124	393
95th Queue (ft)	299	339	468	506	291	269	429
Link Distance (ft)	263	263	386	386	395	395	395
Upstream Blk Time (%)	4	10	47	11	1	0	74
Queuing Penalty (veh)	20	50	0	0	3	3	436
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	TR	UL	L	L	T	T	T
Maximum Queue (ft)	679	800	820	780	758	720	176	188	170	145	126	118
Average Queue (ft)	222	695	753	653	596	497	148	144	124	55	59	53
95th Queue (ft)	656	871	891	856	855	837	181	189	183	108	99	102
Link Distance (ft)	793	793	793	793	793	793	140	140	140	140	140	140
Upstream Blk Time (%)	2	7	27	16	10	10	9	6	4	0	0	0
Queuing Penalty (veh)	0	0	0	0	0	0	47	33	18	1	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SB	SB	SW	SW	SW	SW
Directions Served	L	L	L	T	TR	<L	L	L	LR
Maximum Queue (ft)	205	648	658	639	624	165	172	166	170
Average Queue (ft)	19	628	632	618	357	161	138	124	106
95th Queue (ft)	99	661	644	725	758	165	186	177	179
Link Distance (ft)		616	616	616	616	146	146	146	146
Upstream Blk Time (%)		83	98	61	0	41	13	10	8
Queuing Penalty (veh)		0	0	0	0	55	17	13	10
Storage Bay Dist (ft)	200								
Storage Blk Time (%)	0	0							
Queuing Penalty (veh)	0	1							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	169	155	128	127	65	114	280	256	265	291	280	265
Average Queue (ft)	105	82	51	51	29	45	201	165	178	244	243	262
95th Queue (ft)	165	143	102	100	57	96	302	266	343	312	311	282
Link Distance (ft)	140	140	140	140	140	140	250	250	250	250	250	
Upstream Blk Time (%)	8	1	0	0		0	8	2	17	31	26	62
Queuing Penalty (veh)	38	4	1	0		0	0	0	0	0	0	0
Storage Bay Dist (ft)												500
Storage Blk Time (%)											26	62
Queuing Penalty (veh)											173	313

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB	NB
Directions Served	L	L	T	T	R	>	>
Maximum Queue (ft)	191	454	534	564	591	592	150
Average Queue (ft)	93	150	307	394	554	560	150
95th Queue (ft)	163	284	460	636	570	580	150
Link Distance (ft)	538	538	538	538	538	538	
Upstream Blk Time (%)		0	0	7	36	51	
Queuing Penalty (veh)		0	0	0	0	0	
Storage Bay Dist (ft)							100
Storage Blk Time (%)						45	1
Queuing Penalty (veh)						277	9

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	49	138	168	346	335	277	312
Average Queue (ft)	8	108	124	305	262	131	119
95th Queue (ft)	32	162	177	403	389	304	287
Link Distance (ft)	139	139	139	330	330	330	330
Upstream Blk Time (%)		0	1	37	13	0	2
Queuing Penalty (veh)		1	7	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 2336

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱		↰	↑	↱	↰	↑↱		↰	↑↱	
Volume (vph)	26	417	144	403	501	388	62	206	163	160	211	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.96		1.00	1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3932		1728	1900	1652	1652	3198		1745	3495	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3932		1728	1900	1652	1652	3198		1745	3495	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	453	157	438	545	422	67	224	177	174	229	24
RTOR Reduction (vph)	0	26	0	0	0	255	0	122	0	0	6	0
Lane Group Flow (vph)	0	612	0	438	545	167	67	279	0	174	247	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	2%	1%	3%	0%	2%	0%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		21.0		32.0	32.0	32.0	8.7	24.0		22.0	37.3	
Effective Green, g (s)		21.0		32.0	32.0	32.0	8.7	24.0		22.0	37.3	
Actuated g/C Ratio		0.18		0.27	0.27	0.27	0.07	0.20		0.18	0.31	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		688		460	506	440	119	639		319	1086	
v/s Ratio Prot		c0.16		0.25	c0.29		0.04	c0.09		c0.10	0.07	
v/s Ratio Perm						0.10						
v/c Ratio		0.89		0.95	1.08	0.38	0.56	0.44		0.55	0.23	
Uniform Delay, d1		48.4		43.2	44.0	35.9	53.8	42.1		44.5	30.7	
Progression Factor		1.00		0.75	0.74	0.59	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.4		26.8	59.1	0.5	6.0	2.2		1.9	0.5	
Delay (s)		61.7		59.1	91.7	21.7	59.8	44.2		46.4	31.1	
Level of Service		E		E	F	C	E	D		D	C	
Approach Delay (s)		61.7			60.5			46.5			37.4	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	752	968	0	1198	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3813	3813		3467	1615
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3813	3813		3467	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	817	1052	0	1302	383
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	0	817	1052	0	1302	347
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		58.0	58.0		52.0	52.0
Effective Green, g (s)		58.0	58.0		46.0	46.0
Actuated g/C Ratio		0.48	0.48		0.38	0.38
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1842	1842		1329	619
v/s Ratio Prot		0.21	c0.28		c0.38	0.21
v/s Ratio Perm						
v/c Ratio		0.44	0.57		0.98	0.56
Uniform Delay, d1		20.4	22.1		36.5	29.1
Progression Factor		1.23	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.4		19.7	1.1
Delay (s)		25.1	22.6		56.2	30.2
Level of Service		C	C		E	C
Approach Delay (s)		25.1	22.6		50.3	
Approach LOS		C	C		D	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1335	265	101	1358	1394	488	544	104	140	364	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	0.76			0.94	0.91	0.94	0.95			0.91	
Frt	0.98			1.00	1.00	1.00	0.98			0.97	
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	8086			4831	4916	4872	3400			6238	
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	8086			4831	4916	4872	3400			6238	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1451	288	110	1476	1515	530	591	113	152	396	120
RTOR Reduction (vph)	4	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	1735	0	0	1586	1515	530	688	0	0	668	0
Heavy Vehicles (%)	1%	1%	0%	2%	2%	1%	0%	1%	0%	0%	1%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	
Protected Phases	2		1	1	6	7	7		4	4	
Permitted Phases											
Actuated Green, G (s)	19.0			33.0	57.0	18.0	18.0			10.0	
Effective Green, g (s)	19.0			33.0	57.0	18.0	18.0			10.0	
Actuated g/C Ratio	0.19			0.33	0.57	0.18	0.18			0.10	
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Grp Cap (vph)	1536			1594	2802	876	612			623	
v/s Ratio Prot	c0.21			c0.33	0.31	0.11	c0.20			c0.11	
v/s Ratio Perm											
v/c Ratio	1.13			0.99	0.54	0.61	1.12			1.07	
Uniform Delay, d1	40.5			33.4	13.4	37.7	41.0			45.0	
Progression Factor	1.00			0.52	0.15	1.00	1.00			0.97	
Incremental Delay, d2	67.2			15.6	0.4	3.1	75.8			52.4	
Delay (s)	107.7			33.0	2.4	40.8	116.8			96.0	
Level of Service	F			C	A	D	F			F	
Approach Delay (s)	107.7				18.0		84.2			96.0	
Approach LOS	F				B		F			F	

Intersection Summary			
HCM 2000 Control Delay	61.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	11	52	230	1816	2462	454	103	368	436	416	1059
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.97	0.95	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3440	6536	7695	1615		3433	3610	1900	2787
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3440	6536	7695	1615		3433	3610	1900	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	57	250	1974	2676	493	112	400	474	452	1151
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	41
Lane Group Flow (vph)	0	0	319	1974	2676	559	0	400	474	452	1110
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6 7	6 7		8	8	8	7 8
Permitted Phases											
Actuated Green, G (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Effective Green, g (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Actuated g/C Ratio			0.12	0.44	0.39	0.39		0.34	0.34	0.34	0.46
Clearance Time (s)			5.0	5.0				5.0	5.0	5.0	
Lane Grp Cap (vph)			412	2875	3001	629		1167	1227	646	1282
v/s Ratio Prot			0.09	c0.30	c0.35	0.35		0.12	0.13	0.24	c0.40
v/s Ratio Perm											
v/c Ratio			0.77	0.69	0.89	0.89		0.34	0.39	0.70	0.87
Uniform Delay, d1			42.7	22.5	28.5	28.5		24.7	25.1	28.6	24.2
Progression Factor			1.20	0.21	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			4.0	0.4	4.5	17.0		0.8	0.9	6.2	8.0
Delay (s)			55.3	5.0	33.0	45.5		25.5	26.0	34.8	32.2
Level of Service			E	A	C	D		C	C	C	C
Approach Delay (s)				12.0	35.3				30.4		
Approach LOS				B	D				C		

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	942	0	0	0	0	0	0	0	0	615	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6233	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6233	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1024	0	0	0	0	0	0	0	0	668	237
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	64	0
Lane Group Flow (vph)	0	1024	0	0	0	0	0	0	0	0	841	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Parking (#/hr)			0									
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1308	
v/s Ratio Prot		c0.20									c0.13	
v/s Ratio Perm												
v/c Ratio		0.29									0.64	
Uniform Delay, d1		6.0									36.1	
Progression Factor		1.25									1.00	
Incremental Delay, d2		0.2									2.4	
Delay (s)		7.6									38.5	
Level of Service		A									D	
Approach Delay (s)		7.6			0.0			0.0			38.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	334	325	200	303	276	123	164	211	159	222	182
Average Queue (ft)	214	184	194	274	83	49	87	71	105	94	61
95th Queue (ft)	320	301	223	290	204	109	148	167	165	186	131
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)				45	1						
Queuing Penalty (veh)				296	9						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			33	51		5	21		11	3	
Queuing Penalty (veh)			165	204		5	13		12	5	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	259	294	423	409	259	233	411
Average Queue (ft)	163	177	400	347	115	91	397
95th Queue (ft)	245	272	421	513	215	193	416
Link Distance (ft)	263	263	386	386	395	395	395
Upstream Blk Time (%)	0	1	69	20			81
Queuing Penalty (veh)	1	4	0	0			417
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	TR	UL	L	L	T	T	T
Maximum Queue (ft)	811	820	829	400	367	222	172	179	173	99	105	77
Average Queue (ft)	269	807	809	400	349	146	153	154	155	36	30	24
95th Queue (ft)	816	824	816	400	391	214	169	167	166	80	77	63
Link Distance (ft)	793	793	793				140	140	140	140	140	140
Upstream Blk Time (%)	3	71	98				13	11	11	0		
Queuing Penalty (veh)	0	0	0				61	53	53	0		
Storage Bay Dist (ft)				300	300	300						
Storage Blk Time (%)			75	79	5							
Queuing Penalty (veh)			700	176	10							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SB	SB	SW	SW	SW	SW
Directions Served	L	L	L	T	TR	<L	L	L	LR
Maximum Queue (ft)	116	638	639	637	328	169	181	164	169
Average Queue (ft)	20	623	631	629	152	161	151	139	120
95th Queue (ft)	79	667	635	651	283	167	176	170	178
Link Distance (ft)		616	616	616		146	146	146	146
Upstream Blk Time (%)		56	86	59		39	21	17	9
Queuing Penalty (veh)		0	0	0		60	33	26	14
Storage Bay Dist (ft)	200				300				
Storage Blk Time (%)	0	0		2	0				
Queuing Penalty (veh)	0	1		6	0				

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	116	108	62	68	48	115	398	450	562	562	562	547
Average Queue (ft)	56	38	15	13	5	38	261	433	549	549	468	423
95th Queue (ft)	102	81	41	44	27	83	363	499	623	643	669	652
Link Distance (ft)	140	140	140	140	140	140			547	547	547	
Upstream Blk Time (%)	0	0			0	0			46	28	12	6
Queuing Penalty (veh)	0	0			0	0			0	0	0	0
Storage Bay Dist (ft)							350	350				500
Storage Blk Time (%)							0	7	63		5	24
Queuing Penalty (veh)							0	37	619		30	118

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB	NB
Directions Served	L	L	T	T	R	>	>
Maximum Queue (ft)	145	187	193	548	586	589	150
Average Queue (ft)	69	76	115	104	555	560	39
95th Queue (ft)	121	153	180	339	568	578	147
Link Distance (ft)	538	538	538	538	538	538	
Upstream Blk Time (%)				1	46	91	
Queuing Penalty (veh)				0	0	0	
Storage Bay Dist (ft)							100
Storage Blk Time (%)						71	
Queuing Penalty (veh)						374	

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	92	138	170	325	311	240	269
Average Queue (ft)	17	118	135	287	237	123	117
95th Queue (ft)	70	157	186	349	324	253	256
Link Distance (ft)	139	139	139	297	297	297	297
Upstream Blk Time (%)		0	2	22	4	1	3
Queuing Penalty (veh)		1	8	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 3510

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	534	98	409	493	449	88	434	268	188	232	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	13	10	11	12	11	12	12
Total Lost time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Lane Util. Factor		0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3895		1697	1900	1662	1678	3277		1745	3533	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3895		1697	1900	1662	1678	3277		1745	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	580	107	445	536	488	96	472	291	204	252	29
RTOR Reduction (vph)	0	12	0	0	0	301	0	78	0	0	7	0
Lane Group Flow (vph)	0	725	0	445	536	187	96	685	0	204	274	0
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	2	1	2	0	1	1	2	1	0	3	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		21.0		32.0	32.0	32.0	11.1	25.0		21.0	34.9	
Effective Green, g (s)		21.0		32.0	32.0	32.0	11.1	25.0		21.0	34.9	
Actuated g/C Ratio		0.18		0.27	0.27	0.27	0.09	0.21		0.18	0.29	
Clearance Time (s)		5.0		5.0	5.0	5.0	5.0	6.0		5.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		681		452	506	443	155	682		305	1027	
v/s Ratio Prot		c0.19		0.26	c0.28		0.06	c0.21		c0.12	0.08	
v/s Ratio Perm						0.11						
v/c Ratio		1.07		0.98	1.06	0.42	0.62	1.00		0.67	0.27	
Uniform Delay, d1		49.5		43.8	44.0	36.4	52.4	47.5		46.3	32.7	
Progression Factor		1.00		0.75	0.75	0.56	1.00	1.00		1.00	1.00	
Incremental Delay, d2		53.2		34.2	53.0	0.5	7.2	35.4		5.5	0.6	
Delay (s)		102.7		66.9	85.8	20.9	59.6	82.9		51.7	33.3	
Level of Service		F		E	F	C	E	F		D	C	
Approach Delay (s)		102.7			58.5			80.3			41.1	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	70.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	999	970	0	1361	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	14	14	12	12	12
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3851	3813		3433	1599
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3851	3813		3433	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1086	1054	0	1479	420
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	0	1086	1054	0	1479	384
Heavy Vehicles (%)	0%	0%	1%	0%	2%	1%
Turn Type		NA	NA		Prot	custom
Protected Phases		4 8	4 8		1 2	1 2
Permitted Phases						
Actuated Green, G (s)		58.0	58.0		52.0	52.0
Effective Green, g (s)		58.0	58.0		46.0	46.0
Actuated g/C Ratio		0.48	0.48		0.38	0.38
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		1861	1842		1315	612
v/s Ratio Prot		c0.28	0.28		c0.43	0.24
v/s Ratio Perm						
v/c Ratio		0.58	0.57		1.12	0.63
Uniform Delay, d1		22.3	22.1		37.0	30.0
Progression Factor		1.39	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.4		66.5	2.0
Delay (s)		31.2	22.6		103.5	32.0
Level of Service		C	C		F	C
Approach Delay (s)		31.2	22.6		87.7	
Approach LOS		C	C		F	

Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBU	WBL	WBT	SBL	SBT	SBR	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	1925	169	100	1136	1688	597	483	71	144	323	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	11	11	11	11	11
Total Lost time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Util. Factor	0.76			0.94	0.91	0.94	0.95			0.91	
Frt	0.99			1.00	1.00	1.00	0.98			0.98	
Flt Protected	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	8118			4832	4916	4777	3380			6195	
Flt Permitted	1.00			0.95	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	8118			4832	4916	4777	3380			6195	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2092	184	109	1235	1835	649	525	77	157	351	92
RTOR Reduction (vph)	8	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	2268	0	0	1344	1835	649	590	0	0	600	0
Heavy Vehicles (%)	2%	1%	0%	2%	2%	3%	1%	3%	1%	1%	2%
Turn Type	NA		Prot	Prot	NA	Split	NA		Prot	Prot	
Protected Phases	2		1	1	6	7	7		4	4	
Permitted Phases											
Actuated Green, G (s)	27.0			27.0	59.0	17.0	17.0			9.0	
Effective Green, g (s)	27.0			27.0	59.0	17.0	17.0			9.0	
Actuated g/C Ratio	0.27			0.27	0.59	0.17	0.17			0.09	
Clearance Time (s)	5.0			5.0	5.0	5.0	5.0			5.0	
Lane Grp Cap (vph)	2191			1304	2900	812	574			557	
v/s Ratio Prot	c0.28			c0.28	0.37	0.14	c0.17			c0.10	
v/s Ratio Perm											
v/c Ratio	1.04			1.03	0.63	0.80	1.03			1.08	
Uniform Delay, d1	36.5			36.5	13.4	39.9	41.5			45.5	
Progression Factor	1.00			0.61	0.39	1.00	1.00			0.85	
Incremental Delay, d2	29.0			25.8	0.5	8.1	45.1			57.9	
Delay (s)	65.5			48.2	5.7	48.0	86.6			96.4	
Level of Service	E			D	A	D	F			F	
Approach Delay (s)	65.5				23.7		66.5			96.4	
Approach LOS	E				C		E			F	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations											
Volume (vph)	4	74	258	2452	2512	594	76	479	1023	613	1223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor			0.97	0.86	0.81	1.00		0.97	0.95	1.00	0.88
Frt			1.00	1.00	1.00	0.85		1.00	1.00	1.00	0.88
Flt Protected			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)			3478	6408	7471	1615		3433	3539	1881	2830
Flt Permitted			0.95	1.00	1.00	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)			3478	6408	7471	1615		3433	3539	1881	2830
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	80	280	2665	2730	646	83	521	1112	666	1329
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	12
Lane Group Flow (vph)	0	0	364	2665	2730	683	0	521	1112	666	1317
Heavy Vehicles (%)	2%	3%	0%	2%	3%	0%	0%	2%	2%	1%	4%
Turn Type	Prot	Prot	Prot	NA	NA	Prot		Split	NA	Prot	custom
Protected Phases	5	5	5	2	6 7	6 7		8	8	8	7 8
Permitted Phases											
Actuated Green, G (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Effective Green, g (s)			12.0	44.0	39.0	39.0		34.0	34.0	34.0	46.0
Actuated g/C Ratio			0.12	0.44	0.39	0.39		0.34	0.34	0.34	0.46
Clearance Time (s)			5.0	5.0				5.0	5.0	5.0	
Lane Grp Cap (vph)			417	2819	2913	629		1167	1203	639	1301
v/s Ratio Prot			0.10	c0.42	0.37	c0.42		0.15	0.31	0.35	c0.47
v/s Ratio Perm											
v/c Ratio			0.87	0.95	0.94	1.09		0.45	0.92	1.04	1.01
Uniform Delay, d1			43.3	26.8	29.3	30.5		25.7	31.8	33.0	27.0
Progression Factor			1.32	0.23	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2			7.0	2.7	7.3	61.2		1.2	13.2	47.1	28.0
Delay (s)			64.2	9.0	36.6	91.7		26.9	44.9	80.1	55.0
Level of Service			E	A	D	F		C	D	F	E
Approach Delay (s)				15.6	48.2				52.5		
Approach LOS				B	D				D		

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑↑									↑↑↑↱	
Volume (vph)	0	1578	0	0	0	0	0	0	0	0	529	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0									5.0	
Lane Util. Factor		0.91									0.86	
Frt		1.00									0.96	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5136									6305	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5136									6305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1715	0	0	0	0	0	0	0	0	575	177
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	1715	0	0	0	0	0	0	0	0	722	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA									NA	
Protected Phases		2									8	
Permitted Phases												
Actuated Green, G (s)		69.0									21.0	
Effective Green, g (s)		69.0									21.0	
Actuated g/C Ratio		0.69									0.21	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		3543									1324	
v/s Ratio Prot		c0.33									c0.11	
v/s Ratio Perm												
v/c Ratio		0.48									0.55	
Uniform Delay, d1		7.2									35.2	
Progression Factor		0.75									1.00	
Incremental Delay, d2		0.1									1.6	
Delay (s)		5.6									36.9	
Level of Service		A									D	
Approach Delay (s)		5.6			0.0			0.0			36.9	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 38: Mystic Avenue (Route 38) & Mystic Valley Parkway (Route 16)

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	537	523	200	294	289	124	304	326	159	311	265
Average Queue (ft)	441	405	195	272	98	89	179	192	121	129	87
95th Queue (ft)	632	600	222	289	226	154	277	309	178	261	201
Link Distance (ft)	554	554		263	263		1165	1165		1173	1173
Upstream Blk Time (%)	10	5		42	1						
Queuing Penalty (veh)	0	0		283	9						
Storage Bay Dist (ft)			150			75			110		
Storage Blk Time (%)			37	46		14	47		21	4	
Queuing Penalty (veh)			181	189		30	41		25	7	

Intersection: 39: Mystic Valley Parkway (Route 16) & Route 16 SB Connector

Movement	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	294	325	415	401	327	332	412
Average Queue (ft)	231	256	371	281	138	116	397
95th Queue (ft)	296	342	472	491	262	247	414
Link Distance (ft)	263	263	386	386	395	395	395
Upstream Blk Time (%)	3	9	41	10		0	74
Queuing Penalty (veh)	15	44	0	0		0	439
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	TR	UL	L	L	T	T	T
Maximum Queue (ft)	494	746	814	695	638	503	178	178	188	154	124	117
Average Queue (ft)	137	592	675	556	478	345	144	133	107	54	57	53
95th Queue (ft)	366	860	848	719	658	525	185	186	186	107	100	103
Link Distance (ft)	793	793	793	793	793	793	140	140	140	140	140	140
Upstream Blk Time (%)		0	6	1	0		8	6	4	0	0	0
Queuing Penalty (veh)		0	0	0	0		40	29	18	1	0	0
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 42: Mystic Valley Parkway (Route 16)/Mystic Valley Parkway & Middlesex Avenue

Movement	SB	SB	SB	SB	SB	SW	SW	SW	SW
Directions Served	L	L	L	T	TR	<L	L	L	LR
Maximum Queue (ft)	132	660	660	641	621	165	176	173	171
Average Queue (ft)	13	631	633	608	313	161	131	122	108
95th Queue (ft)	65	647	645	746	709	165	186	179	181
Link Distance (ft)		616	616	616	616	146	146	146	146
Upstream Blk Time (%)		83	98	55	0	38	10	10	8
Queuing Penalty (veh)		0	0	0	0	50	13	14	11
Storage Bay Dist (ft)	200								
Storage Blk Time (%)		0							
Queuing Penalty (veh)		0							

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	U<L	L	T	T	T	T	T	T	T	T	T	R>
Maximum Queue (ft)	169	161	147	127	100	97	262	249	271	276	267	273
Average Queue (ft)	106	81	58	55	34	47	173	139	132	217	233	264
95th Queue (ft)	160	142	107	101	68	81	298	270	311	319	322	285
Link Distance (ft)	140	140	140	140	140	140	250	250	250	250	250	
Upstream Blk Time (%)	9	2	0	0	0		8	3	11	18	21	71
Queuing Penalty (veh)	43	8	1	0	0		0	0	0	0	0	0
Storage Bay Dist (ft)												500
Storage Blk Time (%)											21	71
Queuing Penalty (veh)											143	357

Intersection: 142: Fellsway (Route 28) & Mystic Valley Parkway/Mystic Valley Parkway (Route 16)

Movement	NB	NB	NB	NB	NB	NB	NB
Directions Served	L	L	T	T	R	>	>
Maximum Queue (ft)	195	312	474	556	580	592	150
Average Queue (ft)	93	146	290	341	551	560	148
95th Queue (ft)	159	271	422	593	588	578	176
Link Distance (ft)	538	538	538	538	538	538	
Upstream Blk Time (%)		0	0	4	33	54	
Queuing Penalty (veh)		0	0	0	0	0	
Storage Bay Dist (ft)							100
Storage Blk Time (%)						45	1
Queuing Penalty (veh)						277	8

Intersection: 143: Middlesex Avenue & Fellsway (Route 28)

Movement	NB	NB	NB	SW	SW	SW	SW
Directions Served	T	T	T	T	T	T	TR
Maximum Queue (ft)	83	138	170	346	346	330	279
Average Queue (ft)	7	121	139	308	261	128	121
95th Queue (ft)	43	160	183	402	407	303	284
Link Distance (ft)	139	139	139	330	330	330	330
Upstream Blk Time (%)		0	3	47	25	0	1
Queuing Penalty (veh)		2	16	0	0	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 2295

B.8 Sullivan Square/Rutherford Avenue, Boston

a. Synchro Output
    a. Existing (2014) Conditions
    b. No Build (2023) Conditions
    c. Build (2023) Conditions
    d. Build (2023) Mitigated Conditions
b. VISSIM Output

Synchro Output

Existing (2014) Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	651	0	0	552	316	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3471			3438	1787	1495
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3471			3438	1787	1495
Peak-hour factor, PHF	0.82	0.82	0.86	0.86	0.93	0.93
Adj. Flow (vph)	794	0	0	642	340	341
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	794	0	0	642	340	341
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.3			55.3	25.5	25.5
Effective Green, g (s)	55.3			55.3	25.5	25.5
Actuated g/C Ratio	0.61			0.61	0.28	0.28
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2113			2093	501	419
v/s Ratio Prot	c0.23			0.19	0.19	c0.23
v/s Ratio Perm						
v/c Ratio	0.38			0.31	0.68	0.81
Uniform Delay, d1	9.0			8.5	29.0	30.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.5			0.4	3.6	11.5
Delay (s)	9.5			8.9	32.7	41.9
Level of Service	A			A	C	D
Approach Delay (s)	9.5			8.9	37.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1170	160	0	0	0	0	0	993	183	436	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		4940	1495						2733	3019	3223	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		4940	1495						2733	3019	3223	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84
Adj. Flow (vph)	0	1360	186	0	0	0	0	0	1128	218	519	0
RTOR Reduction (vph)	0	0	102	0	0	0	0	0	40	66	0	0
Lane Group Flow (vph)	0	1360	84	0	0	0	0	0	1088	152	519	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		37.2	37.2						53.6	11.4	71.0	
Effective Green, g (s)		37.2	37.2						53.6	11.4	71.0	
Actuated g/C Ratio		0.31	0.31						0.45	0.10	0.60	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1541	466						1228	288	1919	
v/s Ratio Prot		c0.28							c0.40	c0.05	0.16	
v/s Ratio Perm			0.06									
v/c Ratio		0.88	0.18						0.89	0.53	0.27	
Uniform Delay, d1		38.9	29.9						30.0	51.3	11.6	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		6.3	0.2						9.6	1.7	0.3	
Delay (s)		45.3	30.1						39.6	53.1	12.0	
Level of Service		D	C						D	D	B	
Approach Delay (s)		43.4			0.0			39.6			24.1	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	903	47	16	539	41	10	2	89	1	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.89	0.89	0.89	0.82	0.82	0.82	0.50	0.50	0.50
Hourly flow rate (vph)	21	1062	55	18	606	46	12	2	109	2	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.94			0.89			0.92	0.92	0.89	0.92	0.92	0.94
vC, conflicting volume	652			1118			1477	1820	559	1348	1825	326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	493			876			1031	1404	245	890	1409	145
tC, single (s)	5.3			4.5			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			91	98	84	99	100	99
cM capacity (veh/h)	710			592			143	122	675	174	121	826

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	552	586	321	349	123	8
Volume Left	21	0	18	0	12	2
Volume Right	0	55	0	46	109	6
cSH	710	1700	592	1700	463	427
Volume to Capacity	0.03	0.34	0.03	0.21	0.27	0.02
Queue Length 95th (ft)	2	0	2	0	27	1
Control Delay (s)	0.8	0.0	1.0	0.0	15.6	13.6
Lane LOS	A		A		C	B
Approach Delay (s)	0.4		0.5		15.6	13.6
Approach LOS					C	B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	208	183	194	191	327	317
Average Queue (ft)	127	80	81	82	156	156
95th Queue (ft)	190	161	160	154	266	266
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	492	419	323	127	244	252	199	179	198	178
Average Queue (ft)	357	300	184	46	208	210	115	48	106	48
95th Queue (ft)	467	395	289	88	258	256	186	142	175	129
Link Distance (ft)	483	483	483		201	201	422	422	422	422
Upstream Blk Time (%)	1	0			13	13				
Queuing Penalty (veh)	0	0			63	67				
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			1							
Queuing Penalty (veh)			2							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	177	180	86	46	104	14
Average Queue (ft)	50	37	11	2	46	2
95th Queue (ft)	140	128	45	20	85	9
Link Distance (ft)	218	218	201	201	275	182
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	2	1				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 133

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	472	0	0	486	263	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3539	1770	1538
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3539	1770	1538
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.91	0.91
Adj. Flow (vph)	508	0	0	512	289	487
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	508	0	0	512	289	487
Heavy Vehicles (%)	3%	0%	0%	2%	2%	5%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.1			55.1	33.3	33.3
Effective Green, g (s)	55.1			55.1	33.3	33.3
Actuated g/C Ratio	0.56			0.56	0.34	0.34
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1962			1981	598	520
v/s Ratio Prot	c0.14			0.14	0.16	c0.32
v/s Ratio Perm						
v/c Ratio	0.26			0.26	0.48	0.94
Uniform Delay, d1	11.1			11.1	25.7	31.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.3	0.6	24.4
Delay (s)	11.5			11.5	26.4	56.0
Level of Service	B			B	C	E
Approach Delay (s)	11.5			11.5	44.9	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	98.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1018	146	0	0	0	0	0	882	203	348	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		5036	1524						2733	3367	3471	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		5036	1524						2733	3367	3471	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	0	1119	160	0	0	0	0	0	969	231	395	0
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	39	66	0	0
Lane Group Flow (vph)	0	1119	50	0	0	0	0	0	930	165	395	0
Heavy Vehicles (%)	0%	3%	6%	2%	2%	2%	0%	0%	4%	4%	4%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		32.7	32.7						54.1	11.0	71.1	
Effective Green, g (s)		32.7	32.7						54.1	11.0	71.1	
Actuated g/C Ratio		0.28	0.28						0.47	0.10	0.62	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1434	434						1287	322	2149	
v/s Ratio Prot		c0.22							c0.34	c0.05	0.11	
v/s Ratio Perm			0.03									
v/c Ratio		0.78	0.11						0.72	0.51	0.18	
Uniform Delay, d1		37.7	30.4						24.3	49.3	9.4	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		2.8	0.1						3.5	1.4	0.2	
Delay (s)		40.6	30.5						27.9	50.7	9.6	
Level of Service		D	C						C	D	A	
Approach Delay (s)		39.3			0.0			27.9			24.8	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	114.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	862	29	1	482	11	4	0	19	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.70	0.70	0.70	0.25	0.25	0.25
Hourly flow rate (vph)	24	871	29	1	507	12	6	0	27	4	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.97			0.94			0.95	0.95	0.94	0.95	0.95	0.97
vC, conflicting volume	519			900			1190	1455	450	1026	1464	259
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			755			938	1217	274	767	1226	163
tC, single (s)	5.2			4.1			8.0	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.2			3.8	4.0	3.4	3.5	4.0	3.3
p0 queue free %	97			100			97	100	96	98	100	100
cM capacity (veh/h)	792			809			174	168	655	263	166	830

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	460	465	255	265	33	4
Volume Left	24	0	1	0	6	4
Volume Right	0	29	0	12	27	0
cSH	792	1700	809	1700	442	263
Volume to Capacity	0.03	0.27	0.00	0.16	0.07	0.02
Queue Length 95th (ft)	2	0	0	0	6	1
Control Delay (s)	0.9	0.0	0.1	0.0	13.8	18.9
Lane LOS	A		A		B	C
Approach Delay (s)	0.4		0.0		13.8	18.9
Approach LOS					B	C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	194	174	170	165	255	467
Average Queue (ft)	105	46	82	79	128	247
95th Queue (ft)	172	114	153	138	223	400
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	427	375	249	82	233	242	209	181	168	143
Average Queue (ft)	298	252	138	39	182	185	114	57	80	26
95th Queue (ft)	397	346	242	69	250	256	190	157	146	92
Link Distance (ft)	481	481	481		201	201	422	422	422	422
Upstream Blk Time (%)	0				7	8				
Queuing Penalty (veh)	0				29	34				
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	133	103	18	5	70	6
Average Queue (ft)	34	16	1	0	22	0
95th Queue (ft)	99	64	18	4	56	4
Link Distance (ft)	218	218	201	201	164	182
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 64

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	653	294	539	91	119	35	165	59	151	46	40	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1833	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1833	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	666	300	550	98	128	38	188	67	172	52	45	403
RTOR Reduction (vph)	0	0	303	0	9	0	0	64	0	0	0	0
Lane Group Flow (vph)	666	300	247	0	255	0	188	175	0	0	97	403
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	67.4	67.4	67.4		16.6		21.5	21.5			24.5	24.5
Effective Green, g (s)	67.4	67.4	67.4		16.6		21.5	21.5			24.5	24.5
Actuated g/C Ratio	0.45	0.45	0.45		0.11		0.14	0.14			0.16	0.16
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	776	825	711		362		236	223			299	455
v/s Ratio Prot	c0.39	0.16	0.16		c0.08		c0.11	0.11			0.05	c0.14
v/s Ratio Perm												
v/c Ratio	0.86	0.36	0.35		0.70		0.80	0.78			0.32	0.89
Uniform Delay, d1	37.0	27.2	27.0		64.3		62.1	62.0			55.4	61.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	11.8	1.2	1.3		6.1		16.8	16.3			0.6	18.3
Delay (s)	48.9	28.4	28.3		70.5		78.9	78.3			56.1	79.7
Level of Service	D	C	C		E		E	E			E	E
Approach Delay (s)		37.4			70.5			78.6			75.1	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1244	644	580	675	232	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.79	0.79
Adj. Flow (vph)	1296	671	604	703	294	309
RTOR Reduction (vph)	0	374	0	0	0	132
Lane Group Flow (vph)	1296	297	604	703	294	177
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	29.0	29.0	47.8	42.1	16.1	68.9
Effective Green, g (s)	29.0	29.0	47.8	42.1	16.1	68.9
Actuated g/C Ratio	0.24	0.24	0.40	0.35	0.13	0.57
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1533	386	691	2183	456	1497
v/s Ratio Prot	c0.20		c0.35	c0.11	c0.09	0.07
v/s Ratio Perm		0.19				
v/c Ratio	0.85	0.77	0.87	0.32	0.64	0.12
Uniform Delay, d1	43.4	42.4	33.3	28.5	49.2	11.7
Progression Factor	1.00	1.00	1.46	0.94	1.00	1.00
Incremental Delay, d2	5.9	13.8	10.5	0.1	3.1	0.0
Delay (s)	49.3	56.2	59.2	27.0	52.4	11.7
Level of Service	D	E	E	C	D	B
Approach Delay (s)	51.6			41.9	31.5	
Approach LOS	D			D	C	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱				↰	↑	↱
Volume (vph)	180	860	432	0	1039	461	0	0	0	461	353	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	186	887	445	0	1082	480	0	0	0	485	372	219
RTOR Reduction (vph)	0	0	269	0	0	290	0	0	0	0	0	147
Lane Group Flow (vph)	186	887	176	0	1082	190	0	0	0	485	372	72
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.1	47.4	47.4		47.4	47.4				39.5	39.5	39.5
Effective Green, g (s)	18.1	47.4	47.4		47.4	47.4				39.5	39.5	39.5
Actuated g/C Ratio	0.15	0.39	0.39		0.39	0.39				0.33	0.33	0.33
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	264	1951	625		1951	619				565	613	494
v/s Ratio Prot	c0.11	0.18	0.11		c0.22	0.12				c0.28	0.20	0.05
v/s Ratio Perm												
v/c Ratio	0.70	0.45	0.28		0.55	0.31				0.86	0.61	0.15
Uniform Delay, d1	48.4	26.8	24.7		28.1	25.0				37.6	33.7	28.4
Progression Factor	1.37	0.37	1.71		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	5.7	0.5	0.8		1.1	1.3				12.3	1.7	0.1
Delay (s)	71.9	10.5	42.9		29.3	26.3				49.9	35.4	28.5
Level of Service	E	B	D		C	C				D	D	C
Approach Delay (s)		27.5			28.3			0.0			40.6	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	581	572	250	265	197	283	311	639	648
Average Queue (ft)	479	293	50	152	80	144	145	545	624
95th Queue (ft)	645	622	214	229	178	241	266	852	641
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	12	4					0	45	97
Queuing Penalty (veh)	0	0					0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		6							2
Queuing Penalty (veh)		35							4

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	443	415	499	518	200	450	887	854	130	146	224	193
Average Queue (ft)	296	240	246	428	190	449	844	178	51	45	140	67
95th Queue (ft)	423	370	509	609	255	457	1033	651	113	120	212	166
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	0	1	19			41	1			1	0
Queuing Penalty (veh)	0	0	0	0			129	3			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				16	28	74	0					2
Queuing Penalty (veh)				101	87	124	2					4

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	134
Average Queue (ft)	15
95th Queue (ft)	79
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	234	231	229	236	343	813	769	643	281	250	598	582
Average Queue (ft)	120	70	92	109	88	615	543	289	54	159	478	461
95th Queue (ft)	211	166	182	201	287	879	831	607	201	335	759	756
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)						9	3	0			42	46
Queuing Penalty (veh)						0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	2	0						1	0	18	5	
Queuing Penalty (veh)	7	0						6	0	63	22	

Zone Summary

Zone wide Queuing Penalty: 588

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	383	274	554	103	127	25	161	47	112	76	39	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00			1.00	0.88
Frt		1.00	0.85		0.99		1.00	0.89			1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3371	1599		3353		1668	1575			1839	2814
Flt Permitted		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)		3371	1599		3353		1668	1575			1839	2814
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	391	280	565	105	130	26	175	51	122	84	43	467
RTOR Reduction (vph)	0	0	284	0	5	0	0	60	0	0	0	0
Lane Group Flow (vph)	0	671	281	0	256	0	175	113	0	0	127	467
Heavy Vehicles (%)	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)		62.2	62.2		16.7		20.5	20.5			30.6	30.6
Effective Green, g (s)		62.2	62.2		16.7		20.5	20.5			30.6	30.6
Actuated g/C Ratio		0.41	0.41		0.11		0.14	0.14			0.20	0.20
Clearance Time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1397	663		373		227	215			375	574
v/s Ratio Prot		c0.20	0.18		c0.08		c0.10	0.07			0.07	c0.17
v/s Ratio Perm												
v/c Ratio		0.48	0.42		0.69		0.77	0.53			0.34	0.81
Uniform Delay, d1		32.1	31.2		64.1		62.5	60.2			51.0	57.0
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.2	2.0		5.2		14.9	2.3			0.5	8.6
Delay (s)		33.3	33.2		69.3		77.4	62.6			51.6	65.6
Level of Service		C	C		E		E	E			D	E
Approach Delay (s)		33.2			69.3			70.0			62.6	
Approach LOS		C			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1363	499	295	397	208	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6166	1599	1612	6408	3367	2429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6166	1599	1612	6408	3367	2429
Peak-hour factor, PHF	0.93	0.93	0.86	0.86	0.96	0.96
Adj. Flow (vph)	1466	537	343	462	217	174
RTOR Reduction (vph)	0	241	0	0	0	14
Lane Group Flow (vph)	1466	296	343	462	217	160
Heavy Vehicles (%)	6%	1%	12%	2%	4%	17%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	60.8	60.8	32.2	60.8	13.0	50.2
Effective Green, g (s)	60.8	60.8	32.2	60.8	13.0	50.2
Actuated g/C Ratio	0.51	0.51	0.27	0.51	0.11	0.42
Clearance Time (s)	5.0	5.0	4.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	3124	810	432	3246	364	1016
v/s Ratio Prot	c0.24		c0.21	0.07	c0.06	0.07
v/s Ratio Perm		0.18				
v/c Ratio	0.47	0.37	0.79	0.14	0.60	0.16
Uniform Delay, d1	19.2	17.9	40.8	15.7	51.0	21.7
Progression Factor	1.00	1.00	1.53	0.37	1.00	1.00
Incremental Delay, d2	0.5	1.3	9.5	0.1	2.6	0.1
Delay (s)	19.7	19.2	72.1	5.9	53.6	21.8
Level of Service	B	B	E	A	D	C
Approach Delay (s)	19.5			34.1	39.5	
Approach LOS	B			C	D	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	202	742	574	0	574	233	0	0	0	257	285	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4803	1509		4848	1302				1410	1881	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4803	1509		4848	1302				1410	1881	1501
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	215	789	611	0	624	253	0	0	0	276	306	115
RTOR Reduction (vph)	0	0	329	0	0	136	0	0	0	0	0	86
Lane Group Flow (vph)	215	789	282	0	624	117	0	0	0	276	306	29
Heavy Vehicles (%)	3%	8%	7%	0%	7%	24%	2%	2%	2%	28%	1%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	19.9	55.3	55.3		55.3	55.3				29.8	29.8	29.8
Effective Green, g (s)	19.9	55.3	55.3		55.3	55.3				29.8	29.8	29.8
Actuated g/C Ratio	0.17	0.46	0.46		0.46	0.46				0.25	0.25	0.25
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	290	2213	695		2234	600				350	467	372
v/s Ratio Prot	c0.12	0.16	c0.19		0.13	0.09				c0.20	0.16	0.02
v/s Ratio Perm												
v/c Ratio	0.74	0.36	0.41		0.28	0.19				0.79	0.66	0.08
Uniform Delay, d1	47.6	20.9	21.4		20.0	19.2				42.2	40.5	34.6
Progression Factor	1.08	0.92	5.65		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	9.0	0.4	1.6		0.3	0.7				11.2	3.3	0.1
Delay (s)	60.2	19.5	122.8		20.3	19.9				53.3	43.8	34.6
Level of Service	E	B	F		C	B				D	D	C
Approach Delay (s)		64.0			20.2			0.0			46.1	
Approach LOS		E			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	569	554	207	274	233	241	212	627	645
Average Queue (ft)	399	298	29	171	107	128	101	422	597
95th Queue (ft)	563	504	160	250	213	218	185	851	716
Link Distance (ft)	557	557		409	409	372	372	613	613
Upstream Blk Time (%)	2	0						27	66
Queuing Penalty (veh)	0	0						0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		4							3
Queuing Penalty (veh)		25							6

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	391	336	343	497	200	396	50	77	74	88	209	169
Average Queue (ft)	233	175	119	225	111	247	14	11	14	41	127	56
95th Queue (ft)	334	304	258	406	268	369	43	45	49	79	185	153
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)			0	0							0	0
Queuing Penalty (veh)			0	0							0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				16	2	1						1
Queuing Penalty (veh)				78	8	1						2

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	122
Average Queue (ft)	12
95th Queue (ft)	64
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	240	271	202	193	502	339	268	128	148	250	490	163
Average Queue (ft)	133	107	105	92	296	177	95	13	11	197	220	71
95th Queue (ft)	228	184	165	159	486	289	215	65	77	274	391	131
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)											0	
Queuing Penalty (veh)											0	
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	4	0								10	5	
Queuing Penalty (veh)	10	0								30	14	

Network Summary

Network wide Queuing Penalty: 173

No Build (2023) Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	711	0	0	637	331	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3471			3438	1787	1495
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3471			3438	1787	1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93
Adj. Flow (vph)	773	0	0	692	356	408
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	773	0	0	692	356	408
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.2			55.2	29.8	29.8
Effective Green, g (s)	55.2			55.2	29.8	29.8
Actuated g/C Ratio	0.58			0.58	0.31	0.31
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2016			1997	560	468
v/s Ratio Prot	c0.22			0.20	0.20	c0.27
v/s Ratio Perm						
v/c Ratio	0.38			0.35	0.64	0.87
Uniform Delay, d1	10.7			10.4	27.9	30.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			0.5	2.4	16.2
Delay (s)	11.3			10.9	30.3	47.0
Level of Service	B			B	C	D
Approach Delay (s)	11.3			10.9	39.2	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1279	168	0	0	0	0	0	1303	339	518	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		4940	1495						2733	3019	3223	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		4940	1495						2733	3019	3223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1390	183	0	0	0	0	0	1416	368	563	0
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	42	64	0	0
Lane Group Flow (vph)	0	1390	85	0	0	0	0	0	1374	304	563	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		37.4	37.4						49.9	15.1	71.0	
Effective Green, g (s)		37.4	37.4						49.9	15.1	71.0	
Actuated g/C Ratio		0.31	0.31						0.42	0.13	0.59	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1547	468						1142	381	1916	
v/s Ratio Prot		c0.28							c0.50	c0.10	0.17	
v/s Ratio Perm			0.06									
v/c Ratio		0.90	0.18						1.20	0.80	0.29	
Uniform Delay, d1		39.2	29.9						34.8	50.7	11.9	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		7.3	0.2						99.8	11.1	0.4	
Delay (s)		46.5	30.1						134.5	61.8	12.3	
Level of Service		D	C						F	E	B	
Approach Delay (s)		44.6			0.0			134.5			31.8	
Approach LOS		D			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	74.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↱			↰↱			✣			✣	
Volume (veh/h)	19	1038	49	17	623	43	10	2	261	1	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1128	53	18	677	47	11	2	284	1	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.92			0.88			0.92	0.92	0.88	0.92	0.92	0.92
vC, conflicting volume	724			1182			1575	1957	591	1628	1960	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	538			938			1081	1496	269	1138	1500	146
tC, single (s)	5.3			4.5			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			92	98	56	99	100	100
cM capacity (veh/h)	667			555			131	107	649	77	106	814

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	585	617	357	385	297	4
Volume Left	21	0	18	0	11	1
Volume Right	0	53	0	47	284	3
cSH	667	1700	555	1700	549	240
Volume to Capacity	0.03	0.36	0.03	0.23	0.54	0.02
Queue Length 95th (ft)	2	0	3	0	80	1
Control Delay (s)	0.8	0.0	1.1	0.0	19.0	20.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.4		0.5		19.0	20.3
Approach LOS					C	C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	284	245	221	197	418	450
Average Queue (ft)	156	102	105	97	177	247
95th Queue (ft)	251	208	192	174	360	459
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			0	0	2	5
Queuing Penalty (veh)			1	1	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	501	468	348	225	252	257	338	293	233	192
Average Queue (ft)	380	322	205	54	227	232	202	159	125	69
95th Queue (ft)	496	426	300	128	244	249	302	272	204	156
Link Distance (ft)	483	483	483		201	201	422	422	422	422
Upstream Blk Time (%)	2	0			40	45	0			
Queuing Penalty (veh)	0	0			263	295	0			
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			3	0						
Queuing Penalty (veh)			4	0						

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	247	244	172	123	314	11
Average Queue (ft)	183	184	19	7	291	2
95th Queue (ft)	270	264	90	51	302	9
Link Distance (ft)	218	218	201	201	275	182
Upstream Blk Time (%)	6	6	0		100	
Queuing Penalty (veh)	33	33	0		0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 630

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	509	0	0	527	280	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3539	1770	1538
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3539	1770	1538
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.92	0.92
Adj. Flow (vph)	547	0	0	555	304	530
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	547	0	0	555	304	530
Heavy Vehicles (%)	3%	0%	0%	2%	2%	5%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.0			55.0	35.0	35.0
Effective Green, g (s)	55.0			55.0	35.0	35.0
Actuated g/C Ratio	0.55			0.55	0.35	0.35
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1927			1946	619	538
v/s Ratio Prot	0.16			c0.16	0.17	c0.34
v/s Ratio Perm						
v/c Ratio	0.28			0.29	0.49	0.99
Uniform Delay, d1	12.0			12.0	25.5	32.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.4	0.6	34.7
Delay (s)	12.4			12.4	26.1	66.9
Level of Service	B			B	C	E
Approach Delay (s)	12.4			12.4	52.1	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱						↱↱	↰↰	↑↑	
Volume (vph)	0	1078	153	0	0	0	0	0	1014	291	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		5036	1524						2733	3367	3471	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		5036	1524						2733	3367	3471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1172	166	0	0	0	0	0	1102	316	408	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	40	65	0	0
Lane Group Flow (vph)	0	1172	58	0	0	0	0	0	1062	251	408	0
Heavy Vehicles (%)	0%	3%	6%	2%	2%	2%	0%	0%	4%	4%	4%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		34.1	34.1						51.8	13.3	71.1	
Effective Green, g (s)		34.1	34.1						51.8	13.3	71.1	
Actuated g/C Ratio		0.29	0.29						0.45	0.11	0.61	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1477	447						1218	385	2123	
v/s Ratio Prot		c0.23							c0.39	c0.07	0.12	
v/s Ratio Perm			0.04									
v/c Ratio		0.79	0.13						0.87	0.65	0.19	
Uniform Delay, d1		37.8	30.1						29.2	49.2	9.9	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		3.0	0.1						8.7	3.9	0.2	
Delay (s)		40.8	30.3						37.9	53.2	10.1	
Level of Service		D	C						D	D	B	
Approach Delay (s)		39.5			0.0			37.9			28.9	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	116.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	941	30	1	523	12	4	0	73	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	951	30	1	551	13	4	0	79	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.96			0.93			0.95	0.95	0.93	0.95	0.95	0.96
vC, conflicting volume	563			981			1294	1581	490	1164	1590	282
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458			818			1000	1304	288	863	1314	165
tC, single (s)	5.2			4.1			8.0	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.2			3.8	4.0	3.4	3.5	4.0	3.3
p0 queue free %	97			100			97	100	87	99	100	100
cM capacity (veh/h)	763			758			154	148	634	203	146	822

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	501	506	276	288	84	1
Volume Left	25	0	1	0	4	1
Volume Right	0	30	0	13	79	0
cSH	763	1700	758	1700	546	203
Volume to Capacity	0.03	0.30	0.00	0.17	0.15	0.01
Queue Length 95th (ft)	3	0	0	0	13	0
Control Delay (s)	0.9	0.0	0.1	0.0	12.8	22.8
Lane LOS	A		A		B	C
Approach Delay (s)	0.5		0.0		12.8	22.8
Approach LOS					B	C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	215	179	223	198	460	496
Average Queue (ft)	113	56	87	85	177	314
95th Queue (ft)	188	138	175	167	388	520
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			0	0	2	8
Queuing Penalty (veh)			0	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	429	364	241	92	238	248	220	196	180	162
Average Queue (ft)	306	261	145	43	207	211	145	92	87	34
95th Queue (ft)	395	344	248	73	248	257	209	193	151	104
Link Distance (ft)	481	481	481		201	201	422	422	422	422
Upstream Blk Time (%)	0				14	15				
Queuing Penalty (veh)	0				71	76				
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			1							
Queuing Penalty (veh)			1							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	175	194	21	10	137	14
Average Queue (ft)	62	47	1	0	54	1
95th Queue (ft)	148	135	11	5	111	6
Link Distance (ft)	218	218	201	201	164	182
Upstream Blk Time (%)	0	0			0	
Queuing Penalty (veh)	0	1			0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 148

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	320	606	95	125	37	173	62	158	53	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1832	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1832	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	327	618	102	134	40	188	67	172	58	46	468
RTOR Reduction (vph)	0	0	354	0	10	0	0	64	0	0	0	0
Lane Group Flow (vph)	758	327	264	0	266	0	188	175	0	0	104	468
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Effective Green, g (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Actuated g/C Ratio	0.43	0.43	0.43		0.11		0.14	0.14			0.18	0.18
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	737	783	675		371		236	223			335	510
v/s Ratio Prot	c0.44	0.18	0.17		c0.08		c0.11	0.11			0.06	c0.17
v/s Ratio Perm												
v/c Ratio	1.03	0.42	0.39		0.72		0.80	0.78			0.31	0.92
Uniform Delay, d1	43.0	30.0	29.6		64.2		62.1	62.0			53.0	60.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	40.6	1.6	1.7		6.5		16.8	16.3			0.5	21.4
Delay (s)	83.6	31.6	31.3		70.7		78.9	78.3			53.6	81.5
Level of Service	F	C	C		E		E	E			D	F
Approach Delay (s)		54.7			70.7			78.6			76.4	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1435	695	608	747	243	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.92	0.92
Adj. Flow (vph)	1495	724	633	778	264	278
RTOR Reduction (vph)	0	349	0	0	0	119
Lane Group Flow (vph)	1495	375	633	778	264	159
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	29.1	29.1	48.9	42.2	14.9	68.8
Effective Green, g (s)	29.1	29.1	48.9	42.2	14.9	68.8
Actuated g/C Ratio	0.24	0.24	0.41	0.35	0.12	0.57
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1538	387	707	2189	422	1495
v/s Ratio Prot	c0.24		c0.36	c0.12	c0.08	0.06
v/s Ratio Perm		0.23				
v/c Ratio	0.97	0.97	0.90	0.36	0.63	0.11
Uniform Delay, d1	45.0	45.0	33.2	28.8	49.9	11.6
Progression Factor	1.00	1.00	1.42	1.04	1.00	1.00
Incremental Delay, d2	17.2	38.5	11.8	0.1	2.9	0.0
Delay (s)	62.2	83.5	58.9	30.2	52.8	11.7
Level of Service	E	F	E	C	D	B
Approach Delay (s)	69.2			43.1	31.7	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	917	566	0	1128	483	0	0	0	483	370	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	198	945	584	0	1175	503	0	0	0	508	389	229
RTOR Reduction (vph)	0	0	362	0	0	312	0	0	0	0	0	152
Lane Group Flow (vph)	198	945	222	0	1175	191	0	0	0	508	389	77
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Effective Green, g (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Actuated g/C Ratio	0.16	0.38	0.38		0.38	0.38				0.34	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	274	1877	601		1877	595				581	630	507
v/s Ratio Prot	c0.11	0.19	0.14		c0.24	0.12				c0.30	0.21	0.05
v/s Ratio Perm												
v/c Ratio	0.72	0.50	0.37		0.63	0.32				0.87	0.62	0.15
Uniform Delay, d1	48.1	28.5	26.8		30.3	26.3				37.3	33.2	27.7
Progression Factor	1.39	0.45	4.53		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	4.7	0.5	0.9		1.6	1.4				13.7	1.8	0.1
Delay (s)	71.7	13.2	122.5		31.9	27.7				51.0	35.0	27.8
Level of Service	E	B	F		C	C				D	D	C
Approach Delay (s)		56.9			30.6			0.0			40.8	
Approach LOS		E			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	584	584	250	278	231	284	327	627	653
Average Queue (ft)	568	526	77	165	99	148	167	532	625
95th Queue (ft)	609	723	267	251	207	240	302	856	638
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	45	23		0			1	45	99
Queuing Penalty (veh)	0	0		0			0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		15							2
Queuing Penalty (veh)		94							5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	486	507	510	532	200	450	883	848	110	114	225	226
Average Queue (ft)	304	305	451	508	200	449	855	110	47	42	140	73
95th Queue (ft)	432	472	607	519	204	455	1018	484	95	103	210	189
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	0	12	68			46	1			1	0
Queuing Penalty (veh)	0	0	0	0			157	5			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				35	34	75	0					1
Queuing Penalty (veh)				243	123	140	0					4

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB	NB
Directions Served	R	R
Maximum Queue (ft)	150	20
Average Queue (ft)	17	1
95th Queue (ft)	88	16
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	100
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	225	207	218	228	570	862	836	817	299	250	598	597
Average Queue (ft)	116	59	84	105	120	716	675	475	83	120	427	500
95th Queue (ft)	199	152	175	188	383	981	981	889	262	300	797	742
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)					0	42	16	2			43	60
Queuing Penalty (veh)					0	0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	2	1						3	1	11	5	
Queuing Penalty (veh)	6	1						14	3	42	23	

Network Summary

Network wide Queuing Penalty: 858

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	443	295	607	108	133	27	169	49	117	81	41	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00			1.00	0.88
Frt		1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3368	1599		3352		1668	1575			1839	2814
Flt Permitted		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)		3368	1599		3352		1668	1575			1839	2814
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	301	619	110	136	28	184	53	127	88	45	504
RTOR Reduction (vph)	0	0	286	0	6	0	0	60	0	0	0	0
Lane Group Flow (vph)	0	753	333	0	268	0	184	120	0	0	133	504
Heavy Vehicles (%)	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Effective Green, g (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Actuated g/C Ratio		0.39	0.39		0.11		0.14	0.14			0.22	0.22
Clearance Time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1329	631		377		234	221			402	615
v/s Ratio Prot		c0.22	0.21		c0.08		c0.11	0.08			0.07	c0.18
v/s Ratio Perm												
v/c Ratio		0.57	0.53		0.71		0.79	0.54			0.33	0.82
Uniform Delay, d1		35.4	34.7		64.2		62.3	60.0			49.4	55.8
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.8	3.1		6.2		15.8	2.7			0.5	8.4
Delay (s)		37.2	37.8		70.4		78.1	62.7			49.8	64.2
Level of Service		D	D		E		E	E			D	E
Approach Delay (s)		37.5			70.4			70.5			61.2	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	537	309	461	218	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6166	1599	1612	6408	3367	2429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6166	1599	1612	6408	3367	2429
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1613	577	336	501	227	182
RTOR Reduction (vph)	0	234	0	0	0	9
Lane Group Flow (vph)	1613	343	336	501	227	173
Heavy Vehicles (%)	6%	1%	12%	2%	4%	17%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	61.2	61.2	31.2	61.2	13.6	49.8
Effective Green, g (s)	61.2	61.2	31.2	61.2	13.6	49.8
Actuated g/C Ratio	0.51	0.51	0.26	0.51	0.11	0.41
Clearance Time (s)	5.0	5.0	4.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	3144	815	419	3268	381	1008
v/s Ratio Prot	c0.26		c0.21	0.08	c0.07	0.07
v/s Ratio Perm		0.21				
v/c Ratio	0.51	0.42	0.80	0.15	0.60	0.17
Uniform Delay, d1	19.5	18.3	41.5	15.6	50.6	22.1
Progression Factor	1.00	1.00	1.52	0.32	1.00	1.00
Incremental Delay, d2	0.6	1.6	10.3	0.1	2.5	0.1
Delay (s)	20.1	19.9	73.3	5.1	53.1	22.2
Level of Service	C	B	E	A	D	C
Approach Delay (s)	20.1			32.5	39.3	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	786	663	0	646	244	0	0	0	269	298	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4803	1509		4848	1302				1410	1881	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4803	1509		4848	1302				1410	1881	1501
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	228	836	705	0	702	265	0	0	0	289	320	120
RTOR Reduction (vph)	0	0	354	0	0	148	0	0	0	0	0	89
Lane Group Flow (vph)	228	836	351	0	702	117	0	0	0	289	320	31
Heavy Vehicles (%)	3%	8%	7%	0%	7%	24%	2%	2%	2%	28%	1%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	20.8	53.1	53.1		53.1	53.1				31.1	31.1	31.1
Effective Green, g (s)	20.8	53.1	53.1		53.1	53.1				31.1	31.1	31.1
Actuated g/C Ratio	0.17	0.44	0.44		0.44	0.44				0.26	0.26	0.26
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	303	2125	667		2145	576				365	487	389
v/s Ratio Prot	c0.13	0.17	c0.23		0.14	0.09				c0.20	0.17	0.02
v/s Ratio Perm												
v/c Ratio	0.75	0.39	0.53		0.33	0.20				0.79	0.66	0.08
Uniform Delay, d1	47.2	22.6	24.3		21.8	20.5				41.4	39.7	33.6
Progression Factor	1.10	0.95	4.06		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	9.1	0.5	2.6		0.4	0.8				11.2	3.2	0.1
Delay (s)	61.1	22.1	101.2		22.2	21.3				52.6	42.9	33.7
Level of Service	E	C	F		C	C				D	D	C
Approach Delay (s)		58.6			22.0			0.0			45.2	
Approach LOS		E			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	45.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	581	580	250	257	223	284	226	632	653
Average Queue (ft)	511	444	65	168	100	147	100	587	628
95th Queue (ft)	645	652	245	243	209	252	187	804	652
Link Distance (ft)	557	557		409	409	372	372	613	613
Upstream Blk Time (%)	17	5				0		40	89
Queuing Penalty (veh)	0	0				0		0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		10							3
Queuing Penalty (veh)		60							6

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	410	373	486	514	200	428	303	73	66	88	227	178
Average Queue (ft)	256	199	162	282	149	264	24	11	17	46	138	64
95th Queue (ft)	360	327	361	498	285	401	139	43	51	83	207	162
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	0	1	2							0	0
Queuing Penalty (veh)	0	0	0	0							0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				20	3	3						1
Queuing Penalty (veh)				110	13	3						2

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	136
Average Queue (ft)	16
95th Queue (ft)	77
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	242	287	233	194	633	370	297	166	149	250	565	222
Average Queue (ft)	147	121	121	106	362	216	140	21	12	216	255	80
95th Queue (ft)	241	224	203	174	577	328	276	86	84	282	454	161
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)					0						1	0
Queuing Penalty (veh)					0						0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	6	1								12	7	
Queuing Penalty (veh)	15	2								36	19	

Network Summary

Network wide Queuing Penalty: 266

Build (2023) Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	739	0	0	664	331	638
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3471			3438	1787	1495
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3471			3438	1787	1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93
Adj. Flow (vph)	803	0	0	722	356	686
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	803	0	0	722	356	686
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.0			55.0	35.0	35.0
Effective Green, g (s)	55.0			55.0	35.0	35.0
Actuated g/C Ratio	0.55			0.55	0.35	0.35
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1909			1890	625	523
v/s Ratio Prot	c0.23			0.21	0.20	c0.46
v/s Ratio Perm						
v/c Ratio	0.42			0.38	0.57	1.31
Uniform Delay, d1	13.2			12.8	26.4	32.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			0.6	1.2	153.5
Delay (s)	13.9			13.4	27.6	186.0
Level of Service	B			B	C	F
Approach Delay (s)	13.9			13.4	131.9	
Approach LOS	B			B	F	

Intersection Summary			
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1320	168	0	0	0	0	0	1589	339	545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		4940	1495						2733	3019	3223	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		4940	1495						2733	3019	3223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1435	183	0	0	0	0	0	1727	368	592	0
RTOR Reduction (vph)	0	0	94	0	0	0	0	0	43	64	0	0
Lane Group Flow (vph)	0	1435	89	0	0	0	0	0	1684	304	592	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		37.8	37.8						49.9	15.1	71.0	
Effective Green, g (s)		37.8	37.8						49.9	15.1	71.0	
Actuated g/C Ratio		0.32	0.32						0.42	0.13	0.59	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1558	471						1138	380	1910	
v/s Ratio Prot		c0.29							c0.62	c0.10	0.18	
v/s Ratio Perm			0.06									
v/c Ratio		0.92	0.19						1.48	0.80	0.31	
Uniform Delay, d1		39.6	29.8						35.0	50.9	12.2	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		9.3	0.2						220.8	11.5	0.4	
Delay (s)		48.9	30.0						255.8	62.3	12.6	
Level of Service		D	C						F	E	B	
Approach Delay (s)		46.7			0.0			255.8			31.7	
Approach LOS		D			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	127.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	119.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	1324	49	17	650	43	10	2	261	1	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1439	53	18	707	47	11	2	284	1	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.92			0.87			0.91	0.91	0.87	0.91	0.91	0.92
vC, conflicting volume	753			1492			1901	2297	746	1812	2301	377
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	552			1259			1381	1818	398	1284	1822	142
tC, single (s)	5.3			4.5			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			85	97	46	98	100	100
cM capacity (veh/h)	651			402			75	66	526	48	66	813

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	740	773	372	400	297	4
Volume Left	21	0	18	0	11	1
Volume Right	0	53	0	47	284	3
cSH	651	1700	402	1700	414	162
Volume to Capacity	0.03	0.45	0.05	0.24	0.72	0.03
Queue Length 95th (ft)	2	0	4	0	138	2
Control Delay (s)	0.9	0.0	1.5	0.0	32.9	27.8
Lane LOS	A		A		D	D
Approach Delay (s)	0.4		0.7		32.9	27.8
Approach LOS					D	D

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	376	326	227	231	534	548
Average Queue (ft)	193	144	112	110	502	515
95th Queue (ft)	302	271	208	201	570	535
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			1	1	55	88
Queuing Penalty (veh)			2	2	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	513	452	346	214	263	262	327	276	249	193
Average Queue (ft)	404	336	215	54	230	234	203	160	141	89
95th Queue (ft)	516	435	322	131	249	251	296	255	222	181
Link Distance (ft)	483	483	483		201	201	422	422	422	422
Upstream Blk Time (%)	3	0			49	50	0			
Queuing Penalty (veh)	0	0			386	396	0			
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			3							
Queuing Penalty (veh)			5							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	245	245	150	134	311	13
Average Queue (ft)	213	217	30	15	285	1
95th Queue (ft)	262	262	112	78	301	7
Link Distance (ft)	218	218	201	201	275	182
Upstream Blk Time (%)	14	14	0		100	
Queuing Penalty (veh)	97	98	0		0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 987

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	542	0	0	559	280	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3539	1770	1538
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3539	1770	1538
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.92	0.92
Adj. Flow (vph)	583	0	0	588	304	866
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	583	0	0	588	304	866
Heavy Vehicles (%)	3%	0%	0%	2%	2%	5%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.0			55.0	35.0	35.0
Effective Green, g (s)	55.0			55.0	35.0	35.0
Actuated g/C Ratio	0.55			0.55	0.35	0.35
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1927			1946	619	538
v/s Ratio Prot	c0.17			0.17	0.17	c0.56
v/s Ratio Perm						
v/c Ratio	0.30			0.30	0.49	1.61
Uniform Delay, d1	12.1			12.1	25.5	32.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.4	0.6	282.9
Delay (s)	12.6			12.5	26.1	315.4
Level of Service	B			B	C	F
Approach Delay (s)	12.6			12.5	240.2	
Approach LOS	B			B	F	

Intersection Summary			
HCM 2000 Control Delay	126.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱						↱↱	↰↰	↑↑	
Volume (vph)	0	1135	153	0	0	0	0	0	1356	291	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		5036	1524						2733	3367	3471	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		5036	1524						2733	3367	3471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1234	166	0	0	0	0	0	1474	316	442	0
RTOR Reduction (vph)	0	0	101	0	0	0	0	0	41	65	0	0
Lane Group Flow (vph)	0	1234	65	0	0	0	0	0	1433	251	442	0
Heavy Vehicles (%)	0%	3%	6%	2%	2%	2%	0%	0%	4%	4%	4%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		35.3	35.3						51.7	13.4	71.1	
Effective Green, g (s)		35.3	35.3						51.7	13.4	71.1	
Actuated g/C Ratio		0.30	0.30						0.44	0.11	0.61	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1514	458						1203	384	2102	
v/s Ratio Prot		c0.25							c0.52	c0.07	0.13	
v/s Ratio Perm			0.04									
v/c Ratio		0.82	0.14						1.19	0.65	0.21	
Uniform Delay, d1		38.0	30.0						32.9	49.8	10.5	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		3.5	0.1						94.6	4.0	0.2	
Delay (s)		41.5	30.1						127.4	53.8	10.7	
Level of Service		D	C						F	D	B	
Approach Delay (s)		40.2			0.0			127.4			28.6	
Approach LOS		D			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	73.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1283	30	1	555	12	4	0	73	1	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	1296	30	1	584	13	4	0	79	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.95			0.92			0.94	0.94	0.92	0.94	0.94	0.95
vC, conflicting volume	597			1326			1656	1961	663	1370	1969	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	475			1178			1343	1667	456	1041	1676	161
tC, single (s)	5.2			4.1			8.0	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.2			3.8	4.0	3.4	3.5	4.0	3.3
p0 queue free %	97			100			95	100	84	99	100	100
cM capacity (veh/h)	744			551			83	89	487	144	87	820

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	673	678	293	305	84	1
Volume Left	25	0	1	0	4	1
Volume Right	0	30	0	13	79	0
cSH	744	1700	551	1700	388	144
Volume to Capacity	0.03	0.40	0.00	0.18	0.22	0.01
Queue Length 95th (ft)	3	0	0	0	20	1
Control Delay (s)	0.9	0.0	0.1	0.0	16.8	30.3
Lane LOS	A		A		C	D
Approach Delay (s)	0.5		0.0		16.8	30.3
Approach LOS					C	D

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	188	157	193	197	532	548
Average Queue (ft)	115	55	93	91	507	516
95th Queue (ft)	179	126	173	171	519	537
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			0	0	48	88
Queuing Penalty (veh)			0	0	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	458	408	277	78	246	257	215	181	176	143
Average Queue (ft)	327	273	157	44	219	224	138	87	91	28
95th Queue (ft)	431	369	253	75	249	258	204	188	160	87
Link Distance (ft)	481	481	481		201	201	422	422	422	422
Upstream Blk Time (%)	0	0			23	25				
Queuing Penalty (veh)	0	0			153	167				
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			1							
Queuing Penalty (veh)			1							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	220	189	7	10	138	6
Average Queue (ft)	99	85	0	0	59	1
95th Queue (ft)	193	172	4	7	123	5
Link Distance (ft)	218	218	201	201	164	182
Upstream Blk Time (%)	0	0			2	
Queuing Penalty (veh)	1	0			0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 323

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰	↱
Volume (vph)	727	0	0	653	331	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3471			3438	1787	1495
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3471			3438	1787	1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93
Adj. Flow (vph)	790	0	0	710	356	567
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	790	0	0	710	356	567
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	2			6	4	4
Permitted Phases						
Actuated Green, G (s)	55.0			55.0	35.0	35.0
Effective Green, g (s)	55.0			55.0	35.0	35.0
Actuated g/C Ratio	0.55			0.55	0.35	0.35
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1909			1890	625	523
v/s Ratio Prot	c0.23			0.21	0.20	c0.38
v/s Ratio Perm						
v/c Ratio	0.41			0.38	0.57	1.08
Uniform Delay, d1	13.1			12.8	26.4	32.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			0.6	1.2	64.1
Delay (s)	13.8			13.3	27.6	96.6
Level of Service	B			B	C	F
Approach Delay (s)	13.8			13.3	70.0	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱						↱↱	↰↰	↑↑	
Volume (vph)	0	1302	168	0	0	0	0	0	1466	339	533	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0						6.0	6.0	6.0	
Lane Util. Factor		0.91	1.00						0.88	0.97	0.95	
Frt		1.00	0.85						0.85	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		4940	1495						2733	3019	3223	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		4940	1495						2733	3019	3223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1415	183	0	0	0	0	0	1593	368	579	0
RTOR Reduction (vph)	0	0	96	0	0	0	0	0	43	64	0	0
Lane Group Flow (vph)	0	1415	87	0	0	0	0	0	1550	304	579	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA	Perm						custom	Prot	NA	
Protected Phases		4							2	1	6	
Permitted Phases			4									
Actuated Green, G (s)		37.6	37.6						49.9	15.1	71.0	
Effective Green, g (s)		37.6	37.6						49.9	15.1	71.0	
Actuated g/C Ratio		0.31	0.31						0.42	0.13	0.59	
Clearance Time (s)		5.0	5.0						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		1553	470						1140	381	1913	
v/s Ratio Prot		c0.29							c0.57	c0.10	0.18	
v/s Ratio Perm			0.06									
v/c Ratio		0.91	0.19						1.36	0.80	0.30	
Uniform Delay, d1		39.4	29.8						34.8	50.8	12.0	
Progression Factor		1.00	1.00						1.00	1.00	1.00	
Incremental Delay, d2		8.4	0.2						167.8	11.1	0.4	
Delay (s)		47.8	30.0						202.6	61.9	12.4	
Level of Service		D	C						F	E	B	
Approach Delay (s)		45.8			0.0			202.6			31.7	
Approach LOS		D			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	102.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	119.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	1201	49	17	638	43	10	2	261	1	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1305	53	18	693	47	11	2	284	1	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		255			329							
pX, platoon unblocked	0.92			0.87			0.91	0.91	0.87	0.91	0.91	0.92
vC, conflicting volume	740			1359			1760	2151	679	1733	2154	370
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546			1111			1244	1673	330	1213	1677	144
tC, single (s)	5.3			4.5			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.8			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			89	97	51	98	100	100
cM capacity (veh/h)	658			464			96	82	584	61	81	813

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	673	706	365	393	297	4
Volume Left	21	0	18	0	11	1
Volume Right	0	53	0	47	284	3
cSH	658	1700	464	1700	475	198
Volume to Capacity	0.03	0.42	0.04	0.23	0.63	0.02
Queue Length 95th (ft)	2	0	3	0	105	2
Control Delay (s)	0.9	0.0	1.3	0.0	24.4	23.6
Lane LOS	A		A		C	C
Approach Delay (s)	0.4		0.6		24.4	23.6
Approach LOS					C	C

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	389	349	230	219	542	541
Average Queue (ft)	193	137	115	112	487	511
95th Queue (ft)	313	274	207	189	618	538
Link Distance (ft)	671	671	218	218	492	492
Upstream Blk Time (%)			1	0	48	76
Queuing Penalty (veh)			2	1	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	R	R	R	L	L	T	T
Maximum Queue (ft)	499	480	354	154	251	263	314	263	241	218
Average Queue (ft)	406	336	211	47	228	234	201	158	142	90
95th Queue (ft)	505	434	309	97	242	251	284	246	213	177
Link Distance (ft)	483	483	483		201	201	422	422	422	422
Upstream Blk Time (%)	2	0			48	51				
Queuing Penalty (veh)	0	0			354	371				
Storage Bay Dist (ft)				200						
Storage Blk Time (%)			2							
Queuing Penalty (veh)			3							

Intersection: 58: Cambridge Street

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	264	246	171	147	295	18
Average Queue (ft)	216	217	23	14	286	1
95th Queue (ft)	258	255	103	79	298	9
Link Distance (ft)	218	218	201	201	275	182
Upstream Blk Time (%)	16	14	0	0	100	
Queuing Penalty (veh)	97	90	0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 919

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	320	606	95	125	37	173	62	158	53	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1832	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1832	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	327	618	102	134	40	188	67	172	58	46	468
RTOR Reduction (vph)	0	0	354	0	10	0	0	64	0	0	0	0
Lane Group Flow (vph)	758	327	264	0	266	0	188	175	0	0	104	468
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Effective Green, g (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Actuated g/C Ratio	0.43	0.43	0.43		0.11		0.14	0.14			0.18	0.18
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	737	783	675		371		236	223			335	510
v/s Ratio Prot	c0.44	0.18	0.17		c0.08		c0.11	0.11			0.06	c0.17
v/s Ratio Perm												
v/c Ratio	1.03	0.42	0.39		0.72		0.80	0.78			0.31	0.92
Uniform Delay, d1	43.0	30.0	29.6		64.2		62.1	62.0			53.0	60.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	40.6	1.6	1.7		6.5		16.8	16.3			0.5	21.4
Delay (s)	83.6	31.6	31.3		70.7		78.9	78.3			53.6	81.5
Level of Service	F	C	C		E		E	E			D	F
Approach Delay (s)		54.7			70.7			78.6			76.4	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1669	695	608	849	243	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.92	0.92
Adj. Flow (vph)	1739	724	633	884	264	278
RTOR Reduction (vph)	0	300	0	0	0	119
Lane Group Flow (vph)	1739	424	633	884	264	159
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	29.1	29.1	48.6	42.5	14.9	68.5
Effective Green, g (s)	29.1	29.1	48.6	42.5	14.9	68.5
Actuated g/C Ratio	0.24	0.24	0.41	0.35	0.12	0.57
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1538	387	703	2204	422	1488
v/s Ratio Prot	c0.27		c0.36	c0.14	c0.08	0.06
v/s Ratio Perm		0.27				
v/c Ratio	1.13	1.10	0.90	0.40	0.63	0.11
Uniform Delay, d1	45.5	45.5	33.4	29.2	49.9	11.8
Progression Factor	1.00	1.00	1.41	1.05	1.00	1.00
Incremental Delay, d2	67.6	74.0	12.0	0.1	2.9	0.0
Delay (s)	113.1	119.5	59.0	30.7	52.8	11.8
Level of Service	F	F	E	C	D	B
Approach Delay (s)	115.0			42.5	31.8	
Approach LOS	F			D	C	

Intersection Summary			
HCM 2000 Control Delay	80.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱				↰	↑	↱
Volume (vph)	192	1017	700	0	1230	483	0	0	0	483	370	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	198	1048	722	0	1281	503	0	0	0	508	389	229
RTOR Reduction (vph)	0	0	363	0	0	303	0	0	0	0	0	152
Lane Group Flow (vph)	198	1048	359	0	1281	200	0	0	0	508	389	77
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Effective Green, g (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Actuated g/C Ratio	0.16	0.38	0.38		0.38	0.38				0.34	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	274	1877	601		1877	595				581	630	507
v/s Ratio Prot	c0.11	0.21	0.23		c0.26	0.13				c0.30	0.21	0.05
v/s Ratio Perm												
v/c Ratio	0.72	0.56	0.60		0.68	0.34				0.87	0.62	0.15
Uniform Delay, d1	48.1	29.3	29.8		31.1	26.4				37.3	33.2	27.7
Progression Factor	1.39	0.49	3.26		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.4		2.0	1.5				13.7	1.8	0.1
Delay (s)	68.0	14.4	97.7		33.2	28.0				51.0	35.0	27.8
Level of Service	E	B	F		C	C				D	D	C
Approach Delay (s)		50.4			31.7			0.0			40.8	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	579	582	250	281	219	293	296	632	644
Average Queue (ft)	558	488	94	159	91	151	153	556	625
95th Queue (ft)	640	742	292	244	190	241	274	842	635
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	37	16					0	50	98
Queuing Penalty (veh)	0	0					0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		14	0						2
Queuing Penalty (veh)		87	0						5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	479	495	512	535	200	450	887	808	136	140	229	209
Average Queue (ft)	331	323	471	509	198	450	867	122	53	49	144	76
95th Queue (ft)	464	481	580	522	232	450	921	503	111	120	211	180
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	1	1	13	65			48	1			1	0
Queuing Penalty (veh)	0	0	0	0			174	3			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				45	24	77						1
Queuing Penalty (veh)				314	99	163						3

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB	NB
Directions Served	R	R
Maximum Queue (ft)	144	21
Average Queue (ft)	18	1
95th Queue (ft)	86	16
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	100
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	241	222	236	341	676	841	829	774	300	250	606	598
Average Queue (ft)	116	66	97	123	168	737	693	510	91	116	422	503
95th Queue (ft)	209	164	200	248	499	980	971	907	281	298	786	739
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)					0	41	13	2			45	61
Queuing Penalty (veh)					0	0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	4	0						5	1	11	5	
Queuing Penalty (veh)	12	0						25	3	41	24	

Zone Summary

Zone wide Queuing Penalty: 954

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	443	295	607	108	133	27	169	49	117	81	41	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00			1.00	0.88
Frt		1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3368	1599		3352		1668	1575			1839	2814
Flt Permitted		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)		3368	1599		3352		1668	1575			1839	2814
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	301	619	110	136	28	184	53	127	88	45	504
RTOR Reduction (vph)	0	0	286	0	6	0	0	60	0	0	0	0
Lane Group Flow (vph)	0	753	333	0	268	0	184	120	0	0	133	504
Heavy Vehicles (%)	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Effective Green, g (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Actuated g/C Ratio		0.39	0.39		0.11		0.14	0.14			0.22	0.22
Clearance Time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1329	631		377		234	221			402	615
v/s Ratio Prot		c0.22	0.21		c0.08		c0.11	0.08			0.07	c0.18
v/s Ratio Perm												
v/c Ratio		0.57	0.53		0.71		0.79	0.54			0.33	0.82
Uniform Delay, d1		35.4	34.7		64.2		62.3	60.0			49.4	55.8
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.8	3.1		6.2		15.8	2.7			0.5	8.4
Delay (s)		37.2	37.8		70.4		78.1	62.7			49.8	64.2
Level of Service		D	D		E		E	E			D	E
Approach Delay (s)		37.5			70.4			70.5			61.2	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↱	↰	↑↑↑↑	↰↰	↱↱
Volume (vph)	1783	537	309	591	218	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6166	1599	1612	6408	3367	2429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6166	1599	1612	6408	3367	2429
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1917	577	336	642	227	182
RTOR Reduction (vph)	0	197	0	0	0	4
Lane Group Flow (vph)	1917	380	336	642	227	178
Heavy Vehicles (%)	6%	1%	12%	2%	4%	17%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	61.2	61.2	31.2	61.2	13.6	49.8
Effective Green, g (s)	61.2	61.2	31.2	61.2	13.6	49.8
Actuated g/C Ratio	0.51	0.51	0.26	0.51	0.11	0.41
Clearance Time (s)	5.0	5.0	4.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	3144	815	419	3268	381	1008
v/s Ratio Prot	c0.31		c0.21	0.10	c0.07	0.07
v/s Ratio Perm		0.24				
v/c Ratio	0.61	0.47	0.80	0.20	0.60	0.18
Uniform Delay, d1	20.9	18.9	41.5	16.0	50.6	22.2
Progression Factor	1.00	1.00	1.52	0.29	1.00	1.00
Incremental Delay, d2	0.9	1.9	10.1	0.1	2.5	0.1
Delay (s)	21.8	20.8	73.0	4.7	53.1	22.2
Level of Service	C	C	E	A	D	C
Approach Delay (s)	21.6			28.2	39.4	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	912	820	0	776	244	0	0	0	269	298	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4803	1509		4848	1302				1410	1881	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4803	1509		4848	1302				1410	1881	1501
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	228	970	872	0	843	265	0	0	0	289	320	120
RTOR Reduction (vph)	0	0	354	0	0	148	0	0	0	0	0	89
Lane Group Flow (vph)	228	970	518	0	843	117	0	0	0	289	320	31
Heavy Vehicles (%)	3%	8%	7%	0%	7%	24%	2%	2%	2%	28%	1%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	20.8	53.1	53.1		53.1	53.1				31.1	31.1	31.1
Effective Green, g (s)	20.8	53.1	53.1		53.1	53.1				31.1	31.1	31.1
Actuated g/C Ratio	0.17	0.44	0.44		0.44	0.44				0.26	0.26	0.26
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	303	2125	667		2145	576				365	487	389
v/s Ratio Prot	c0.13	0.20	c0.34		0.17	0.09				c0.20	0.17	0.02
v/s Ratio Perm												
v/c Ratio	0.75	0.46	0.78		0.39	0.20				0.79	0.66	0.08
Uniform Delay, d1	47.2	23.4	28.4		22.6	20.5				41.4	39.7	33.6
Progression Factor	1.08	1.07	3.22		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	8.5	0.6	7.2		0.5	0.8				11.2	3.2	0.1
Delay (s)	59.2	25.6	98.6		23.1	21.3				52.6	42.9	33.7
Level of Service	E	C	F		C	C				D	D	C
Approach Delay (s)		60.1			22.7			0.0			45.2	
Approach LOS		E			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	572	572	250	309	230	247	322	628	647
Average Queue (ft)	441	354	58	181	120	144	102	605	630
95th Queue (ft)	594	566	232	276	223	245	217	750	640
Link Distance (ft)	557	557		409	409	372	372	613	613
Upstream Blk Time (%)	4	1						32	95
Queuing Penalty (veh)	0	0						0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		9							3
Queuing Penalty (veh)		54							7

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	541	506	525	530	200	449	547	96	80	94	244	190
Average Queue (ft)	300	263	400	455	185	302	69	24	29	49	135	63
95th Queue (ft)	437	428	640	618	268	477	311	61	66	87	209	165
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	1	0	6	24							1	
Queuing Penalty (veh)	0	0	0	0							0	
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				35	5	13	0					2
Queuing Penalty (veh)				191	21	19	0					3

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	66
Average Queue (ft)	2
95th Queue (ft)	22
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	245	261	258	772	743	461	408	242	166	250	580	199
Average Queue (ft)	145	125	131	152	534	262	169	56	15	223	315	84
95th Queue (ft)	243	194	199	353	699	419	354	188	91	284	550	142
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)											2	
Queuing Penalty (veh)											0	
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	5	0						0		19	6	
Queuing Penalty (veh)	15	1						0		55	17	

Network Summary

Network wide Queuing Penalty: 383

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	320	606	95	125	37	173	62	158	53	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1832	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1832	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	327	618	102	134	40	188	67	172	58	46	468
RTOR Reduction (vph)	0	0	354	0	10	0	0	64	0	0	0	0
Lane Group Flow (vph)	758	327	264	0	266	0	188	175	0	0	104	468
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Effective Green, g (s)	64.0	64.0	64.0		17.0		21.5	21.5			27.5	27.5
Actuated g/C Ratio	0.43	0.43	0.43		0.11		0.14	0.14			0.18	0.18
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	737	783	675		371		236	223			335	510
v/s Ratio Prot	c0.44	0.18	0.17		c0.08		c0.11	0.11			0.06	c0.17
v/s Ratio Perm												
v/c Ratio	1.03	0.42	0.39		0.72		0.80	0.78			0.31	0.92
Uniform Delay, d1	43.0	30.0	29.6		64.2		62.1	62.0			53.0	60.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	40.6	1.6	1.7		6.5		16.8	16.3			0.5	21.4
Delay (s)	83.6	31.6	31.3		70.7		78.9	78.3			53.6	81.5
Level of Service	F	C	C		E		E	E			D	F
Approach Delay (s)		54.7			70.7			78.6			76.4	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1569	695	608	805	243	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.92	0.92
Adj. Flow (vph)	1634	724	633	839	264	278
RTOR Reduction (vph)	0	320	0	0	0	119
Lane Group Flow (vph)	1634	404	633	839	264	159
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	29.0	29.0	48.7	42.4	14.9	68.6
Effective Green, g (s)	29.0	29.0	48.7	42.4	14.9	68.6
Actuated g/C Ratio	0.24	0.24	0.41	0.35	0.12	0.57
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1533	386	704	2199	422	1490
v/s Ratio Prot	c0.26		c0.36	c0.13	c0.08	0.06
v/s Ratio Perm		0.25				
v/c Ratio	1.07	1.05	0.90	0.38	0.63	0.11
Uniform Delay, d1	45.5	45.5	33.4	29.0	49.9	11.7
Progression Factor	1.00	1.00	1.41	1.04	1.00	1.00
Incremental Delay, d2	42.8	58.5	11.9	0.1	2.9	0.0
Delay (s)	88.3	104.0	59.0	30.3	52.8	11.8
Level of Service	F	F	E	C	D	B
Approach Delay (s)	93.1			42.7	31.7	
Approach LOS	F			D	C	

Intersection Summary			
HCM 2000 Control Delay	68.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱				↰	↑	↱
Volume (vph)	192	974	642	0	1186	483	0	0	0	483	370	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	198	1004	662	0	1235	503	0	0	0	508	389	229
RTOR Reduction (vph)	0	0	363	0	0	312	0	0	0	0	0	152
Lane Group Flow (vph)	198	1004	299	0	1235	191	0	0	0	508	389	77
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Effective Green, g (s)	18.8	45.6	45.6		45.6	45.6				40.6	40.6	40.6
Actuated g/C Ratio	0.16	0.38	0.38		0.38	0.38				0.34	0.34	0.34
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	274	1877	601		1877	595				581	630	507
v/s Ratio Prot	c0.11	0.20	0.19		c0.25	0.12				c0.30	0.21	0.05
v/s Ratio Perm												
v/c Ratio	0.72	0.53	0.50		0.66	0.32				0.87	0.62	0.15
Uniform Delay, d1	48.1	28.9	28.4		30.8	26.3				37.3	33.2	27.7
Progression Factor	1.39	0.48	3.55		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	3.3	0.4	1.0		1.8	1.4				13.7	1.8	0.1
Delay (s)	70.4	14.2	102.0		32.6	27.7				51.0	35.0	27.8
Level of Service	E	B	F		C	C				D	D	C
Approach Delay (s)		51.3			31.2			0.0			40.8	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	585	586	250	242	191	253	310	623	644
Average Queue (ft)	568	505	76	154	91	140	142	548	625
95th Queue (ft)	602	737	265	224	179	224	265	839	634
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	44	19					0	44	99
Queuing Penalty (veh)	0	0					0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		13	0						2
Queuing Penalty (veh)		78	0						5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	474	479	520	539	200	450	885	731	242	140	220	186
Average Queue (ft)	327	315	454	507	199	450	873	88	56	45	141	67
95th Queue (ft)	451	474	599	534	223	450	886	407	164	111	206	168
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	1	11	61			51	1			0	0
Queuing Penalty (veh)	0	0	0	0			180	4			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				39	30	77	0					1
Queuing Penalty (veh)				274	116	155	0					4

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	61
Average Queue (ft)	4
95th Queue (ft)	36
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	217	197	226	228	429	864	842	824	300	250	607	595
Average Queue (ft)	115	64	93	111	114	778	748	596	117	85	470	554
95th Queue (ft)	198	157	183	193	360	964	966	976	312	249	812	657
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)						54	19	3			60	81
Queuing Penalty (veh)						0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	2	1						6	1	7	3	
Queuing Penalty (veh)	5	1						28	4	25	13	

Network Summary

Network wide Queuing Penalty: 891

Build (2023) Mitigated Conditions

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↱						↑↑↱				
Volume (vph)	0	266	10	0	0	0	0	1272	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0				
Lane Util. Factor		1.00						0.91				
Frt		1.00						0.98				
Flt Protected		1.00						1.00				
Satd. Flow (prot)		1854						4982				
Flt Permitted		1.00						1.00				
Satd. Flow (perm)		1854						4982				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	289	11	0	0	0	0	1383	216	0	0	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	0	297	0	0	0	0	0	1561	0	0	0	0
Turn Type		NA						NA				
Protected Phases		2						1				
Permitted Phases												
Actuated Green, G (s)		12.5						27.5				
Effective Green, g (s)		12.5						27.5				
Actuated g/C Ratio		0.25						0.55				
Clearance Time (s)		5.0						5.0				
Vehicle Extension (s)		3.0						3.0				
Lane Grp Cap (vph)		463						2740				
v/s Ratio Prot		c0.16						c0.31				
v/s Ratio Perm												
v/c Ratio		0.64						0.57				
Uniform Delay, d1		16.7						7.4				
Progression Factor		1.16						1.00				
Incremental Delay, d2		2.6						0.9				
Delay (s)		22.0						8.2				
Level of Service		C						A				
Approach Delay (s)		22.0			0.0			8.2			0.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑		↰	↰↑				
Volume (vph)	0	0	0	0	1891	0	266	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		0.95	0.95				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.95				
Satd. Flow (prot)					3539		1681	1681				
Flt Permitted					1.00		0.95	0.95				
Satd. Flow (perm)					3539		1681	1681				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2055	0	289	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	33	33	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2055	0	111	112	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Actuated Green, G (s)					27.5		12.5	12.5				
Effective Green, g (s)					27.5		12.5	12.5				
Actuated g/C Ratio					0.55		0.25	0.25				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					1946		420	420				
v/s Ratio Prot					c0.58							
v/s Ratio Perm							0.07	0.07				
v/c Ratio					1.06		0.26	0.27				
Uniform Delay, d1					11.2		15.1	15.1				
Progression Factor					1.00		0.06	0.06				
Incremental Delay, d2					37.1		0.3	0.3				
Delay (s)					48.3		1.3	1.3				
Level of Service					D		A	A				
Approach Delay (s)		0.0			48.3			1.3			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	739	0	0	664	331	638
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	0.95
Frt	1.00			1.00	0.95	0.85
Flt Protected	1.00			1.00	0.97	1.00
Satd. Flow (prot)	3471			3438	1688	1421
Flt Permitted	1.00			1.00	0.97	1.00
Satd. Flow (perm)	3471			3438	1688	1421
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93
Adj. Flow (vph)	803	0	0	722	356	686
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	803	0	0	722	541	501
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	1			1	5	5
Permitted Phases						
Actuated Green, G (s)	18.4			18.4	21.6	21.6
Effective Green, g (s)	18.4			18.4	21.6	21.6
Actuated g/C Ratio	0.37			0.37	0.43	0.43
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1277			1265	729	613
v/s Ratio Prot	c0.23			0.21	0.32	c0.35
v/s Ratio Perm						
v/c Ratio	0.63			0.57	0.74	0.82
Uniform Delay, d1	13.0			12.6	11.9	12.5
Progression Factor	1.00			1.38	1.00	1.00
Incremental Delay, d2	2.4			1.6	4.1	8.3
Delay (s)	15.3			19.1	16.0	20.8
Level of Service	B			B	B	C
Approach Delay (s)	15.3			19.1	18.3	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1280	3	0	0	0	0	0	1188	339	545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0							6.0	6.0	6.0	
Lane Util. Factor		0.91							0.88	0.97	0.95	
Frt		1.00							0.85	1.00	1.00	
Flt Protected		1.00							1.00	0.95	1.00	
Satd. Flow (prot)		4938							2733	3019	3223	
Flt Permitted		1.00							1.00	0.95	1.00	
Satd. Flow (perm)		4938							2733	3019	3223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1391	3	0	0	0	0	0	1291	368	592	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	477	346	0	0
Lane Group Flow (vph)	0	1394	0	0	0	0	0	0	814	22	592	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA							custom	Prot	NA	
Protected Phases		5							4	6	1 6	
Permitted Phases												
Actuated Green, G (s)		27.0							27.0	6.0	23.0	
Effective Green, g (s)		27.0							27.0	6.0	23.0	
Actuated g/C Ratio		0.27							0.27	0.06	0.23	
Clearance Time (s)		5.0							6.0	6.0		
Vehicle Extension (s)		3.0							3.0	3.0		
Lane Grp Cap (vph)		1333							737	181	741	
v/s Ratio Prot		c0.28							c0.30	0.01	c0.18	
v/s Ratio Perm												
v/c Ratio		1.05							1.10	0.12	0.80	
Uniform Delay, d1		36.5							36.5	44.5	36.3	
Progression Factor		0.80							0.82	1.00	1.00	
Incremental Delay, d2		35.4							63.2	0.3	6.0	
Delay (s)		64.6							93.0	44.8	42.3	
Level of Service		E							F	D	D	
Approach Delay (s)		64.6			0.0			93.0			43.3	
Approach LOS		E			A			F			D	

Intersection Summary			
HCM 2000 Control Delay	69.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	923	224	17	485	43	10	2	261	1	11	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.97			0.99			0.87			0.87	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1142	3290			3235			1640			1659	
Flt Permitted	0.37	1.00			0.69			0.97			1.00	
Satd. Flow (perm)	450	3290			2251			1593			1653	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	266	1003	243	18	527	47	11	2	284	1	12	195
RTOR Reduction (vph)	0	16	0	0	6	0	0	129	0	0	165	0
Lane Group Flow (vph)	266	1230	0	0	586	0	0	168	0	0	43	0
Heavy Vehicles (%)	58%	3%	21%	19%	5%	64%	20%	0%	0%	0%	0%	0%
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	6	6 1			1			5			5	
Permitted Phases	1			1			5			5		
Actuated Green, G (s)	69.7	74.7			47.5			15.3			15.3	
Effective Green, g (s)	69.7	74.7			47.5			15.3			15.3	
Actuated g/C Ratio	0.70	0.75			0.48			0.15			0.15	
Clearance Time (s)	5.0				5.0			5.0			5.0	
Vehicle Extension (s)	3.0				3.0			3.0			3.0	
Lane Grp Cap (vph)	467	2457			1069			243			252	
v/s Ratio Prot	c0.13	0.37										
v/s Ratio Perm	c0.27				0.26			c0.11			0.03	
v/c Ratio	0.57	0.50			0.55			0.69			0.17	
Uniform Delay, d1	6.4	5.1			18.6			40.1			36.8	
Progression Factor	1.02	0.94			0.55			1.00			2.28	
Incremental Delay, d2	1.2	0.1			1.2			8.2			0.3	
Delay (s)	7.7	4.9			11.5			48.4			84.3	
Level of Service	A	A			B			D			F	
Approach Delay (s)		5.4			11.5			48.4			84.3	
Approach LOS		A			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 3: MBTA Station Drive/Beacham St & Maffa Way

Movement	NB	SE	SE	SE
Directions Served	TR	T	T	TR
Maximum Queue (ft)	274	271	226	189
Average Queue (ft)	117	207	152	105
95th Queue (ft)	225	316	262	240
Link Distance (ft)	260	237	237	237
Upstream Blk Time (%)	1	16	14	18
Queuing Penalty (veh)	3	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Beacham St & Main Street

Movement	WB	WB	NB	NB
Directions Served	T	T	L	LT
Maximum Queue (ft)	248	247	88	90
Average Queue (ft)	217	203	35	38
95th Queue (ft)	256	273	74	77
Link Distance (ft)	204	204	117	117
Upstream Blk Time (%)	35	27		0
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	LR	R
Maximum Queue (ft)	714	720	226	243	523	510
Average Queue (ft)	686	692	122	133	376	309
95th Queue (ft)	774	724	219	228	579	548
Link Distance (ft)	671	671	223	223	493	493
Upstream Blk Time (%)	78	95	1	1	17	10
Queuing Penalty (veh)	0	0	2	4	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	TR	R	R	L	L	T	T
Maximum Queue (ft)	293	293	266	264	281	476	467	465	451
Average Queue (ft)	257	239	197	241	246	433	427	396	264
95th Queue (ft)	345	336	306	254	267	526	538	575	504
Link Distance (ft)	246	246	246	210	210	422	422	422	422
Upstream Blk Time (%)	24	12	6	68	68	80	78	49	3
Queuing Penalty (veh)	101	50	26	403	405	0	0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 58: Spice Street/MBTA Station Drive & Cambridge Street

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	237	253	258	146	154	292	171
Average Queue (ft)	136	227	232	41	45	281	65
95th Queue (ft)	226	248	251	128	133	291	188
Link Distance (ft)	223	223	223	210	210	269	260
Upstream Blk Time (%)	1	22	33	1	1	100	7
Queuing Penalty (veh)	4	103	150	3	3	0	14
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 1270

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	205	3	0	0	0	0	1121	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0				
Lane Util. Factor		1.00						0.91				
Frt		1.00						0.98				
Flt Protected		1.00						1.00				
Satd. Flow (prot)		1859						4981				
Flt Permitted		1.00						1.00				
Satd. Flow (perm)		1859						4981				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	223	3	0	0	0	0	1218	193	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	37	0	0	0	0
Lane Group Flow (vph)	0	225	0	0	0	0	0	1374	0	0	0	0
Turn Type		NA						NA				
Protected Phases		2						1				
Permitted Phases												
Actuated Green, G (s)		11.5						28.5				
Effective Green, g (s)		11.5						28.5				
Actuated g/C Ratio		0.23						0.57				
Clearance Time (s)		5.0						5.0				
Vehicle Extension (s)		3.0						3.0				
Lane Grp Cap (vph)		427						2839				
v/s Ratio Prot		c0.12						c0.28				
v/s Ratio Perm												
v/c Ratio		0.53						0.48				
Uniform Delay, d1		16.9						6.4				
Progression Factor		1.39						1.00				
Incremental Delay, d2		1.1						0.6				
Delay (s)		24.6						7.0				
Level of Service		C						A				
Approach Delay (s)		24.6			0.0			7.0			0.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1290	0	205	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		0.95	0.95				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.95				
Satd. Flow (prot)					3539		1681	1681				
Flt Permitted					1.00		0.95	0.95				
Satd. Flow (perm)					3539		1681	1681				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1402	0	223	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	34	34	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1402	0	77	78	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Actuated Green, G (s)					28.5		11.5	11.5				
Effective Green, g (s)					28.5		11.5	11.5				
Actuated g/C Ratio					0.57		0.23	0.23				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2017		386	386				
v/s Ratio Prot					c0.40							
v/s Ratio Perm							0.05	0.05				
v/c Ratio					0.70		0.20	0.20				
Uniform Delay, d1					7.7		15.5	15.5				
Progression Factor					1.00		0.11	0.11				
Incremental Delay, d2					2.0		0.2	0.2				
Delay (s)					9.7		1.9	1.9				
Level of Service					A		A	A				
Approach Delay (s)		0.0			9.7			1.9			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	542	0	0	559	280	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	0.95
Frt	1.00			1.00	0.93	0.85
Flt Protected	1.00			1.00	0.98	1.00
Satd. Flow (prot)	3505			3539	1659	1461
Flt Permitted	1.00			1.00	0.98	1.00
Satd. Flow (perm)	3505			3539	1659	1461
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.92	0.92
Adj. Flow (vph)	583	0	0	588	304	866
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	583	0	0	588	598	572
Heavy Vehicles (%)	3%	0%	0%	2%	2%	5%
Turn Type	NA			NA	NA	Prot
Protected Phases	1			1	5	5
Permitted Phases						
Actuated Green, G (s)	16.8			16.8	23.2	23.2
Effective Green, g (s)	16.8			16.8	23.2	23.2
Actuated g/C Ratio	0.34			0.34	0.46	0.46
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1177			1189	769	677
v/s Ratio Prot	c0.17			0.17	0.36	c0.39
v/s Ratio Perm						
v/c Ratio	0.50			0.49	0.78	0.84
Uniform Delay, d1	13.2			13.2	11.2	11.8
Progression Factor	1.00			1.55	1.00	1.00
Incremental Delay, d2	1.5			1.4	5.0	9.5
Delay (s)	14.7			21.9	16.2	21.3
Level of Service	B			C	B	C
Approach Delay (s)	14.7			21.9	18.7	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1123	2	0	0	0	0	0	984	291	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0							6.0	6.0	6.0	
Lane Util. Factor		0.91							0.88	0.97	0.95	
Frt		1.00							0.85	1.00	1.00	
Flt Protected		1.00							1.00	0.95	1.00	
Satd. Flow (prot)		5034							2733	3367	3471	
Flt Permitted		1.00							1.00	0.95	1.00	
Satd. Flow (perm)		5034							2733	3367	3471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1221	2	0	0	0	0	0	1070	316	442	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	478	296	0	0
Lane Group Flow (vph)	0	1223	0	0	0	0	0	0	592	20	442	0
Heavy Vehicles (%)	0%	3%	6%	2%	2%	2%	0%	0%	4%	4%	4%	0%
Turn Type		NA							custom	Prot	NA	
Protected Phases		5							4	6	1 6	
Permitted Phases												
Actuated Green, G (s)		26.8							27.0	6.2	23.2	
Effective Green, g (s)		26.8							27.0	6.2	23.2	
Actuated g/C Ratio		0.27							0.27	0.06	0.23	
Clearance Time (s)		5.0							6.0	6.0		
Vehicle Extension (s)		3.0							3.0	3.0		
Lane Grp Cap (vph)		1349							737	208	805	
v/s Ratio Prot		c0.24							c0.22	0.01	c0.13	
v/s Ratio Perm												
v/c Ratio		0.91							0.80	0.09	0.55	
Uniform Delay, d1		35.4							34.0	44.3	33.8	
Progression Factor		0.82							0.78	1.00	1.00	
Incremental Delay, d2		8.1							8.6	0.2	0.8	
Delay (s)		37.1							35.3	44.4	34.6	
Level of Service		D							D	D	C	
Approach Delay (s)		37.1			0.0			35.3			38.7	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	911	209	1	404	12	4	0	73	1	3	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.97			1.00			0.87			0.87	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1157	3409			3426			1492			1649	
Flt Permitted	0.48	1.00			0.88			0.92			1.00	
Satd. Flow (perm)	590	3409			3008			1381			1647	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	220	920	211	1	425	13	4	0	79	1	3	167
RTOR Reduction (vph)	0	10	0	0	1	0	0	72	0	0	152	0
Lane Group Flow (vph)	220	1121	0	0	438	0	0	11	0	0	19	0
Heavy Vehicles (%)	56%	2%	7%	0%	2%	100%	25%	0%	10%	0%	0%	0%
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	6	6 1			1			5			5	
Permitted Phases	1			1			5			5		
Actuated Green, G (s)	76.0	81.0			56.2			9.0			9.0	
Effective Green, g (s)	76.0	81.0			56.2			9.0			9.0	
Actuated g/C Ratio	0.76	0.81			0.56			0.09			0.09	
Clearance Time (s)	5.0				5.0			5.0			5.0	
Vehicle Extension (s)	3.0				3.0			3.0			3.0	
Lane Grp Cap (vph)	560	2761			1690			124			148	
v/s Ratio Prot	0.08	c0.33										
v/s Ratio Perm	0.22				0.15			0.01			c0.01	
v/c Ratio	0.39	0.41			0.26			0.09			0.13	
Uniform Delay, d1	3.6	2.7			11.2			41.7			41.9	
Progression Factor	1.08	1.10			0.50			1.00			1.61	
Incremental Delay, d2	0.3	0.1			0.3			0.3			0.3	
Delay (s)	4.2	3.0			5.9			42.1			67.9	
Level of Service	A	A			A			D			E	
Approach Delay (s)		3.2			5.9			42.1			67.9	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 6: MBTA Station Drive/Beacham St & Maffa Way

Movement	NB	SE	SE	SE
Directions Served	TR	T	T	TR
Maximum Queue (ft)	240	265	232	182
Average Queue (ft)	99	160	102	77
95th Queue (ft)	187	264	226	205
Link Distance (ft)	254	237	237	237
Upstream Blk Time (%)	0	6	10	11
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Beacham St & Main Street

Movement	WB	WB	NB	NB
Directions Served	T	T	L	LT
Maximum Queue (ft)	231	186	88	84
Average Queue (ft)	163	82	28	25
95th Queue (ft)	256	161	72	62
Link Distance (ft)	204	204	117	117
Upstream Blk Time (%)	3	0	0	0
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	LR	R
Maximum Queue (ft)	709	712	208	230	545	534
Average Queue (ft)	645	661	119	128	445	397
95th Queue (ft)	866	807	188	209	611	601
Link Distance (ft)	671	671	222	222	493	493
Upstream Blk Time (%)	70	83	0	0	36	24
Queuing Penalty (veh)	0	0	0	1	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	TR	R	R	L	L	T	T
Maximum Queue (ft)	284	281	257	250	273	449	453	448	387
Average Queue (ft)	238	214	150	237	245	367	341	211	109
95th Queue (ft)	336	313	256	250	263	504	503	463	296
Link Distance (ft)	244	244	244	210	210	422	422	422	422
Upstream Blk Time (%)	13	5	2	68	69	34	28	10	1
Queuing Penalty (veh)	48	17	9	335	339	0	0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 58: Spice Street/MBTA Station Drive & Cambridge Street

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	235	264	264	130	140	209	170
Average Queue (ft)	130	229	234	53	49	173	54
95th Queue (ft)	218	250	250	110	113	196	170
Link Distance (ft)	222	222	222	210	210	158	254
Upstream Blk Time (%)	1	26	37	0	0	98	8
Queuing Penalty (veh)	4	116	167	0	0	0	14
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 1050

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	266	10	0	0	0	0	1254	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0				
Lane Util. Factor		1.00						0.91				
Frt		1.00						0.98				
Flt Protected		1.00						1.00				
Satd. Flow (prot)		1854						4981				
Flt Permitted		1.00						1.00				
Satd. Flow (perm)		1854						4981				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	289	11	0	0	0	0	1363	216	0	0	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	39	0	0	0	0
Lane Group Flow (vph)	0	297	0	0	0	0	0	1540	0	0	0	0
Turn Type		NA						NA				
Protected Phases		2						1				
Permitted Phases												
Actuated Green, G (s)		12.5						27.5				
Effective Green, g (s)		12.5						27.5				
Actuated g/C Ratio		0.25						0.55				
Clearance Time (s)		5.0						5.0				
Vehicle Extension (s)		3.0						3.0				
Lane Grp Cap (vph)		463						2739				
v/s Ratio Prot		c0.16						c0.31				
v/s Ratio Perm												
v/c Ratio		0.64						0.56				
Uniform Delay, d1		16.7						7.3				
Progression Factor		1.20						1.00				
Incremental Delay, d2		2.6						0.8				
Delay (s)		22.8						8.2				
Level of Service		C						A				
Approach Delay (s)		22.8			0.0			8.2			0.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1743	0	266	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		0.95	0.95				
Frt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	0.95				
Satd. Flow (prot)					3539		1681	1681				
Flt Permitted					1.00		0.95	0.95				
Satd. Flow (perm)					3539		1681	1681				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1895	0	289	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	33	33	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1895	0	111	112	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Actuated Green, G (s)					27.5		12.5	12.5				
Effective Green, g (s)					27.5		12.5	12.5				
Actuated g/C Ratio					0.55		0.25	0.25				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					1946		420	420				
v/s Ratio Prot					c0.54							
v/s Ratio Perm							0.07	0.07				
v/c Ratio					0.97		0.26	0.27				
Uniform Delay, d1					10.9		15.1	15.1				
Progression Factor					1.00		0.06	0.06				
Incremental Delay, d2					15.1		0.3	0.3				
Delay (s)					26.0		1.1	1.1				
Level of Service					C		A	A				
Approach Delay (s)		0.0			26.0			1.1			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	727	0	0	653	331	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.95	1.00	0.95
Frt	1.00			1.00	0.96	0.85
Flt Protected	1.00			1.00	0.96	1.00
Satd. Flow (prot)	3471			3438	1712	1421
Flt Permitted	1.00			1.00	0.96	1.00
Satd. Flow (perm)	3471			3438	1712	1421
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93
Adj. Flow (vph)	790	0	0	710	356	567
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	790	0	0	710	481	442
Heavy Vehicles (%)	4%	0%	0%	5%	1%	8%
Turn Type	NA			NA	NA	Prot
Protected Phases	1			1	5	5
Permitted Phases						
Actuated Green, G (s)	20.1			20.1	19.9	19.9
Effective Green, g (s)	20.1			20.1	19.9	19.9
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1395			1382	681	565
v/s Ratio Prot	c0.23			0.21	0.28	c0.31
v/s Ratio Perm						
v/c Ratio	0.57			0.51	0.71	0.78
Uniform Delay, d1	11.6			11.3	12.6	13.2
Progression Factor	1.00			1.35	1.00	1.00
Incremental Delay, d2	1.7			1.2	3.3	7.0
Delay (s)	13.2			16.5	16.0	20.1
Level of Service	B			B	B	C
Approach Delay (s)	13.2			16.5	17.9	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1262	3	0	0	0	0	0	1065	339	533	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0							6.0	6.0	6.0	
Lane Util. Factor		0.91							0.88	0.97	0.95	
Frt		1.00							0.85	1.00	1.00	
Flt Protected		1.00							1.00	0.95	1.00	
Satd. Flow (prot)		4938							2733	3019	3223	
Flt Permitted		1.00							1.00	0.95	1.00	
Satd. Flow (perm)		4938							2733	3019	3223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1372	3	0	0	0	0	0	1158	368	579	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	477	346	0	0
Lane Group Flow (vph)	0	1375	0	0	0	0	0	0	681	22	579	0
Heavy Vehicles (%)	0%	5%	8%	2%	2%	2%	0%	0%	4%	16%	12%	0%
Turn Type		NA							custom	Prot	NA	
Protected Phases		5							4	6	1 6	
Permitted Phases												
Actuated Green, G (s)		27.0							27.0	6.0	23.0	
Effective Green, g (s)		27.0							27.0	6.0	23.0	
Actuated g/C Ratio		0.27							0.27	0.06	0.23	
Clearance Time (s)		5.0							6.0	6.0		
Vehicle Extension (s)		3.0							3.0	3.0		
Lane Grp Cap (vph)		1333							737	181	741	
v/s Ratio Prot		c0.28							c0.25	0.01	c0.18	
v/s Ratio Perm												
v/c Ratio		1.03							0.92	0.12	0.78	
Uniform Delay, d1		36.5							35.5	44.5	36.1	
Progression Factor		0.80							0.84	1.00	1.00	
Incremental Delay, d2		31.0							17.5	0.3	5.4	
Delay (s)		60.2							47.1	44.8	41.5	
Level of Service		E							D	D	D	
Approach Delay (s)		60.2			0.0			47.1			42.8	
Approach LOS		E			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	800	224	17	473	43	10	2	261	1	11	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.97			0.99			0.87			0.87	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1142	3265			3230			1640			1659	
Flt Permitted	0.39	1.00			0.70			0.95			1.00	
Satd. Flow (perm)	473	3265			2261			1555			1652	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	266	870	243	18	514	47	11	2	284	1	12	195
RTOR Reduction (vph)	0	18	0	0	5	0	0	173	0	0	169	0
Lane Group Flow (vph)	266	1095	0	0	574	0	0	124	0	0	39	0
Heavy Vehicles (%)	58%	3%	21%	19%	5%	64%	20%	0%	0%	0%	0%	0%
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	6	6 1			1			5			5	
Permitted Phases	1			1			5			5		
Actuated Green, G (s)	71.7	76.7			51.6			13.3			13.3	
Effective Green, g (s)	71.7	76.7			51.6			13.3			13.3	
Actuated g/C Ratio	0.72	0.77			0.52			0.13			0.13	
Clearance Time (s)	5.0				5.0			5.0			5.0	
Vehicle Extension (s)	3.0				3.0			3.0			3.0	
Lane Grp Cap (vph)	473	2504			1166			206			219	
v/s Ratio Prot	c0.11	0.34										
v/s Ratio Perm	c0.29				0.25			c0.08			0.02	
v/c Ratio	0.56	0.44			0.49			0.60			0.18	
Uniform Delay, d1	5.5	4.1			15.7			40.9			38.5	
Progression Factor	1.07	0.96			0.56			1.00			2.20	
Incremental Delay, d2	1.2	0.1			0.9			4.9			0.3	
Delay (s)	7.1	4.0			9.7			45.8			84.9	
Level of Service	A	A			A			D			F	
Approach Delay (s)		4.6			9.7			45.8			84.9	
Approach LOS		A			A			D			F	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 6: MBTA Station Drive/Beacham St & Maffa Way

Movement	NB	SE	SE	SE
Directions Served	TR	T	T	TR
Maximum Queue (ft)	262	271	254	198
Average Queue (ft)	120	212	145	80
95th Queue (ft)	227	299	256	184
Link Distance (ft)	260	237	237	237
Upstream Blk Time (%)	1	10	5	5
Queuing Penalty (veh)	2	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Beacham St & Main Street

Movement	WB	WB	NB	NB
Directions Served	T	T	L	LT
Maximum Queue (ft)	240	242	100	101
Average Queue (ft)	216	180	41	39
95th Queue (ft)	254	268	79	82
Link Distance (ft)	204	204	117	117
Upstream Blk Time (%)	24	14	0	0
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 52: I-93 NB Off-ramp & Cambridge Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	LR	R
Maximum Queue (ft)	662	668	227	226	384	315
Average Queue (ft)	534	580	99	115	239	145
95th Queue (ft)	954	896	182	192	367	280
Link Distance (ft)	671	671	223	223	493	493
Upstream Blk Time (%)	50	65	0	0		
Queuing Penalty (veh)	0	0	0	1		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 53: Cambridge Street/Alford Street & Maffa Way

Movement	EB	EB	EB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	TR	R	R	L	L	T	T
Maximum Queue (ft)	290	291	257	264	273	481	476	473	445
Average Queue (ft)	266	247	200	242	247	447	443	411	257
95th Queue (ft)	312	298	282	257	265	483	483	562	486
Link Distance (ft)	246	246	246	210	210	422	422	422	422
Upstream Blk Time (%)	23	9	3	66	67	91	90	53	1
Queuing Penalty (veh)	96	38	14	348	357	0	0	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 58: Spice St/MBTA Station Drive & Cambridge Street

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	234	254	268	141	150	295	212
Average Queue (ft)	135	217	228	28	36	283	63
95th Queue (ft)	220	257	262	86	103	293	176
Link Distance (ft)	223	223	223	210	210	269	260
Upstream Blk Time (%)	1	11	20		0	100	4
Queuing Penalty (veh)	5	45	84		0	0	8
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 999

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	320	606	95	125	37	173	62	158	53	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1832	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1832	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	327	618	102	134	40	188	67	172	58	46	468
RTOR Reduction (vph)	0	0	351	0	9	0	0	64	0	0	0	0
Lane Group Flow (vph)	758	327	267	0	267	0	188	175	0	0	104	468
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	64.8	64.8	64.8		15.3		21.5	21.5			28.4	28.4
Effective Green, g (s)	64.8	64.8	64.8		15.3		21.5	21.5			28.4	28.4
Actuated g/C Ratio	0.43	0.43	0.43		0.10		0.14	0.14			0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	746	793	683		334		236	223			346	527
v/s Ratio Prot	c0.44	0.18	0.17		c0.08		c0.11	0.11			0.06	c0.17
v/s Ratio Perm												
v/c Ratio	1.02	0.41	0.39		0.80		0.80	0.78			0.30	0.89
Uniform Delay, d1	42.6	29.4	29.1		65.9		62.1	62.0			52.3	59.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	37.0	1.6	1.7		12.6		16.8	16.3			0.5	16.5
Delay (s)	79.6	31.0	30.8		78.4		78.9	78.3			52.8	75.7
Level of Service	E	C	C		E		E	E			D	E
Approach Delay (s)		52.6			78.4			78.6			71.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	62.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1669	695	608	849	243	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.92	0.92
Adj. Flow (vph)	1739	724	633	884	264	278
RTOR Reduction (vph)	0	300	0	0	0	129
Lane Group Flow (vph)	1739	424	633	884	264	149
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	33.1	33.1	44.6	46.5	14.9	64.5
Effective Green, g (s)	33.1	33.1	44.6	46.5	14.9	64.5
Actuated g/C Ratio	0.28	0.28	0.37	0.39	0.12	0.54
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1750	441	645	2412	422	1401
v/s Ratio Prot	c0.27		c0.36	c0.14	c0.08	0.06
v/s Ratio Perm		0.27				
v/c Ratio	0.99	0.96	0.98	0.37	0.63	0.11
Uniform Delay, d1	43.3	42.8	37.3	26.2	49.9	13.6
Progression Factor	1.00	1.00	1.30	0.97	1.00	1.00
Incremental Delay, d2	20.1	34.3	27.2	0.1	2.9	0.0
Delay (s)	63.4	77.2	75.7	25.4	52.8	13.6
Level of Service	E	E	E	C	D	B
Approach Delay (s)	67.5			46.4	32.7	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	56.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱				↰	↑	↱
Volume (vph)	192	1017	700	0	1230	483	0	0	0	483	370	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	198	1048	722	0	1281	503	0	0	0	508	389	229
RTOR Reduction (vph)	0	0	344	0	0	298	0	0	0	0	0	158
Lane Group Flow (vph)	198	1048	378	0	1281	205	0	0	0	508	389	71
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.8	48.9	48.9		48.9	48.9				37.3	37.3	37.3
Effective Green, g (s)	18.8	48.9	48.9		48.9	48.9				37.3	37.3	37.3
Actuated g/C Ratio	0.16	0.41	0.41		0.41	0.41				0.31	0.31	0.31
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	274	2013	645		2013	638				534	579	466
v/s Ratio Prot	c0.11	0.21	0.24		c0.26	0.13				c0.30	0.21	0.05
v/s Ratio Perm												
v/c Ratio	0.72	0.52	0.59		0.64	0.32				0.95	0.67	0.15
Uniform Delay, d1	48.1	26.7	27.7		28.4	24.2				40.5	36.0	29.9
Progression Factor	1.41	0.23	2.58		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	4.1	0.4	1.7		1.6	1.3				27.1	3.1	0.2
Delay (s)	72.0	6.6	73.0		30.0	25.6				67.6	39.1	30.1
Level of Service	E	A	E		C	C				E	D	C
Approach Delay (s)		37.6			28.7			0.0			50.1	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	591	577	250	272	217	271	331	632	652
Average Queue (ft)	555	464	87	170	105	147	160	543	626
95th Queue (ft)	639	751	283	255	210	231	299	855	639
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	34	16					0	43	98
Queuing Penalty (veh)	0	0					0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		13	0						2
Queuing Penalty (veh)		80	0						5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	498	502	513	536	200	450	882	463	108	111	222	218
Average Queue (ft)	327	322	467	509	198	450	872	62	47	42	141	76
95th Queue (ft)	447	479	584	522	223	451	886	302	95	101	202	183
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	1	14	65			54	0			0	1
Queuing Penalty (veh)	0	0	0	0			197	1			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				46	20	80	0					2
Queuing Penalty (veh)				320	85	170	0					6

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	136
Average Queue (ft)	18
95th Queue (ft)	89
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	229	196	183	320	468	866	853	836	300	249	598	584
Average Queue (ft)	114	40	70	99	63	799	778	637	119	56	558	535
95th Queue (ft)	197	125	146	220	293	974	992	1011	317	212	700	663
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)				0	0	74	29	4			88	70
Queuing Penalty (veh)				0	0	0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	2	0						5	1	7	2	
Queuing Penalty (veh)	7	0						25	5	27	10	

Zone Summary

Zone wide Queuing Penalty: 937

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑	↱		↰↑↱		↰	↑↱			↰	↱↱
Volume (vph)	443	295	607	108	133	27	169	49	117	81	41	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00			1.00	0.88
Frt		1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)		3368	1599		3352		1668	1575			1839	2814
Flt Permitted		0.97	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)		3368	1599		3352		1668	1575			1839	2814
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	301	619	110	136	28	184	53	127	88	45	504
RTOR Reduction (vph)	0	0	286	0	6	0	0	60	0	0	0	0
Lane Group Flow (vph)	0	753	333	0	268	0	184	120	0	0	133	504
Heavy Vehicles (%)	1%	0%	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Effective Green, g (s)		59.2	59.2		16.9		21.1	21.1			32.8	32.8
Actuated g/C Ratio		0.39	0.39		0.11		0.14	0.14			0.22	0.22
Clearance Time (s)		4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1329	631		377		234	221			402	615
v/s Ratio Prot		c0.22	0.21		c0.08		c0.11	0.08			0.07	c0.18
v/s Ratio Perm												
v/c Ratio		0.57	0.53		0.71		0.79	0.54			0.33	0.82
Uniform Delay, d1		35.4	34.7		64.2		62.3	60.0			49.4	55.8
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2		1.8	3.1		6.2		15.8	2.7			0.5	8.4
Delay (s)		37.2	37.8		70.4		78.1	62.7			49.8	64.2
Level of Service		D	D		E		E	E			D	E
Approach Delay (s)		37.5			70.4			70.5			61.2	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1783	537	309	591	218	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6166	1599	1612	6408	3367	2429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6166	1599	1612	6408	3367	2429
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1917	577	336	642	227	182
RTOR Reduction (vph)	0	216	0	0	0	4
Lane Group Flow (vph)	1917	361	336	642	227	178
Heavy Vehicles (%)	6%	1%	12%	2%	4%	17%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	57.5	57.5	34.9	57.5	13.6	53.5
Effective Green, g (s)	57.5	57.5	34.9	57.5	13.6	53.5
Actuated g/C Ratio	0.48	0.48	0.29	0.48	0.11	0.45
Clearance Time (s)	5.0	5.0	4.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2954	766	468	3070	381	1082
v/s Ratio Prot	c0.31		c0.21	0.10	c0.07	0.07
v/s Ratio Perm		0.23				
v/c Ratio	0.65	0.47	0.72	0.21	0.60	0.16
Uniform Delay, d1	23.6	21.0	38.1	18.1	50.6	19.9
Progression Factor	1.00	1.00	1.42	0.49	1.00	1.00
Incremental Delay, d2	1.1	2.1	5.0	0.1	2.5	0.1
Delay (s)	24.7	23.1	59.1	8.9	53.1	20.0
Level of Service	C	C	E	A	D	B
Approach Delay (s)	24.4			26.2	38.3	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	912	820	0	776	244	0	0	0	269	298	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4803	1509		4848	1302				1410	1881	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4803	1509		4848	1302				1410	1881	1501
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	228	970	872	0	843	265	0	0	0	289	320	120
RTOR Reduction (vph)	0	0	326	0	0	142	0	0	0	0	0	91
Lane Group Flow (vph)	228	970	546	0	843	123	0	0	0	289	320	29
Heavy Vehicles (%)	3%	8%	7%	0%	7%	24%	2%	2%	2%	28%	1%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	20.2	55.5	55.5		55.5	55.5				29.3	29.3	29.3
Effective Green, g (s)	20.2	55.5	55.5		55.5	55.5				29.3	29.3	29.3
Actuated g/C Ratio	0.17	0.46	0.46		0.46	0.46				0.24	0.24	0.24
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	294	2221	697		2242	602				344	459	366
v/s Ratio Prot	c0.13	0.20	c0.36		0.17	0.09				c0.20	0.17	0.02
v/s Ratio Perm												
v/c Ratio	0.78	0.44	0.78		0.38	0.20				0.84	0.70	0.08
Uniform Delay, d1	47.7	21.7	27.2		21.0	19.1				43.1	41.3	35.0
Progression Factor	1.18	0.67	2.64		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	9.8	0.5	6.9		0.5	0.8				16.6	4.6	0.1
Delay (s)	66.1	15.0	78.6		21.5	19.9				59.7	45.9	35.1
Level of Service	E	B	E		C	B				E	D	D
Approach Delay (s)		47.4			21.1			0.0			49.6	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	578	572	250	249	211	249	212	630	652
Average Queue (ft)	496	408	83	165	93	139	103	593	630
95th Queue (ft)	655	626	276	240	205	227	188	794	638
Link Distance (ft)	557	557		409	409	372	372	613	613
Upstream Blk Time (%)	16	4						46	95
Queuing Penalty (veh)	0	0						0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		11							3
Queuing Penalty (veh)		69							6

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	437	484	519	536	200	440	286	166	93	108	216	168
Average Queue (ft)	289	253	319	430	179	277	48	39	25	49	132	62
95th Queue (ft)	410	414	583	622	278	425	203	110	69	92	201	161
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	0	1	6	18							0	
Queuing Penalty (veh)	0	0	0	0							0	
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				32	3	4						1
Queuing Penalty (veh)				174	12	6						2

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	134
Average Queue (ft)	12
95th Queue (ft)	70
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	243	216	393	514	767	403	352	175	174	250	604	338
Average Queue (ft)	138	89	102	107	474	231	166	33	13	217	289	81
95th Queue (ft)	227	160	235	279	709	352	292	116	86	291	514	211
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)					0						2	0
Queuing Penalty (veh)					0						0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	4	0						0		17	9	
Queuing Penalty (veh)	12	0						0		51	25	

Network Summary

Network wide Queuing Penalty: 358

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	320	606	95	125	37	173	62	158	53	42	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	11	10	10	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		0.95		1.00	1.00			1.00	0.88
Frt	1.00	1.00	0.85		0.98		1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1728	1837	1583		3276		1652	1562			1832	2787
Flt Permitted	0.95	1.00	1.00		0.98		0.95	1.00			0.97	1.00
Satd. Flow (perm)	1728	1837	1583		3276		1652	1562			1832	2787
Peak-hour factor, PHF	0.98	0.98	0.98	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	327	618	102	134	40	188	67	172	58	46	468
RTOR Reduction (vph)	0	0	351	0	9	0	0	64	0	0	0	0
Lane Group Flow (vph)	758	327	267	0	267	0	188	175	0	0	104	468
Heavy Vehicles (%)	1%	0%	2%	1%	4%	0%	2%	2%	1%	0%	2%	2%
Turn Type	Split	NA	Prot	Split	NA		Split	NA		Split	NA	Prot
Protected Phases	1	1	1	7	7		5	5		6	6	6
Permitted Phases												
Actuated Green, G (s)	64.8	64.8	64.8		15.3		21.5	21.5			28.4	28.4
Effective Green, g (s)	64.8	64.8	64.8		15.3		21.5	21.5			28.4	28.4
Actuated g/C Ratio	0.43	0.43	0.43		0.10		0.14	0.14			0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	746	793	683		334		236	223			346	527
v/s Ratio Prot	c0.44	0.18	0.17		c0.08		c0.11	0.11			0.06	c0.17
v/s Ratio Perm												
v/c Ratio	1.02	0.41	0.39		0.80		0.80	0.78			0.30	0.89
Uniform Delay, d1	42.6	29.4	29.1		65.9		62.1	62.0			52.3	59.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	37.0	1.6	1.7		12.6		16.8	16.3			0.5	16.5
Delay (s)	79.6	31.0	30.8		78.4		78.9	78.3			52.8	75.7
Level of Service	E	C	C		E		E	E			D	E
Approach Delay (s)		52.6			78.4			78.6			71.6	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	62.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1569	695	608	805	243	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	0.86	1.00	1.00	0.86	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6346	1599	1736	6225	3400	2608
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6346	1599	1736	6225	3400	2608
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.92	0.92
Adj. Flow (vph)	1634	724	633	839	264	278
RTOR Reduction (vph)	0	320	0	0	0	128
Lane Group Flow (vph)	1634	404	633	839	264	150
Heavy Vehicles (%)	3%	1%	4%	5%	3%	9%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	1		6	1 2	5	5 6
Permitted Phases		1				
Actuated Green, G (s)	33.0	33.0	44.7	46.4	14.9	64.6
Effective Green, g (s)	33.0	33.0	44.7	46.4	14.9	64.6
Actuated g/C Ratio	0.28	0.28	0.37	0.39	0.12	0.54
Clearance Time (s)	5.0	5.0	4.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1745	439	646	2407	422	1403
v/s Ratio Prot	c0.26		c0.36	c0.13	c0.08	0.06
v/s Ratio Perm		0.25				
v/c Ratio	0.94	0.92	0.98	0.35	0.63	0.11
Uniform Delay, d1	42.5	42.2	37.2	26.1	49.9	13.6
Progression Factor	1.00	1.00	1.31	0.95	1.00	1.00
Incremental Delay, d2	11.0	27.1	26.9	0.1	2.9	0.0
Delay (s)	53.5	69.3	75.5	24.8	52.8	13.6
Level of Service	D	E	E	C	D	B
Approach Delay (s)	58.3			46.6	32.7	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	51.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱				↰	↑	↱
Volume (vph)	192	974	642	0	1186	483	0	0	0	483	370	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	11
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1752	4940	1583		4940	1568				1719	1863	1501
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1752	4940	1583		4940	1568				1719	1863	1501
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	198	1004	662	0	1235	503	0	0	0	508	389	229
RTOR Reduction (vph)	0	0	344	0	0	298	0	0	0	0	0	158
Lane Group Flow (vph)	198	1004	318	0	1235	205	0	0	0	508	389	71
Heavy Vehicles (%)	3%	5%	2%	0%	5%	3%	2%	2%	2%	5%	2%	4%
Turn Type	Prot	NA	Prot		NA	Prot				Split	NA	Prot
Protected Phases	6	1	1		1	1				5	5	5
Permitted Phases												
Actuated Green, G (s)	18.8	48.9	48.9		48.9	48.9				37.3	37.3	37.3
Effective Green, g (s)	18.8	48.9	48.9		48.9	48.9				37.3	37.3	37.3
Actuated g/C Ratio	0.16	0.41	0.41		0.41	0.41				0.31	0.31	0.31
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0				5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	274	2013	645		2013	638				534	579	466
v/s Ratio Prot	c0.11	0.20	0.20		c0.25	0.13				c0.30	0.21	0.05
v/s Ratio Perm												
v/c Ratio	0.72	0.50	0.49		0.61	0.32				0.95	0.67	0.15
Uniform Delay, d1	48.1	26.4	26.4		28.1	24.2				40.5	36.0	29.9
Progression Factor	1.41	0.22	2.80		1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	5.0	0.5	1.4		1.4	1.3				27.1	3.1	0.2
Delay (s)	73.0	6.3	75.3		29.5	25.6				67.6	39.1	30.1
Level of Service	E	A	E		C	C				E	D	C
Approach Delay (s)		37.9			28.4			0.0			50.1	
Approach LOS		D			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 54: Rutherford Avenue & Gilmore Bridge/Austin Street

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LT	TR	L	TR	LT	R
Maximum Queue (ft)	589	582	250	277	226	266	311	639	646
Average Queue (ft)	550	480	101	164	101	140	152	532	625
95th Queue (ft)	656	747	302	247	211	229	271	864	637
Link Distance (ft)	557	557		410	410	379	379	608	608
Upstream Blk Time (%)	35	14					0	43	99
Queuing Penalty (veh)	0	0					0	0	0
Storage Bay Dist (ft)			200						
Storage Blk Time (%)		15	0						2
Queuing Penalty (veh)		92	0						5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	L	T	T	T	T	L	L
Maximum Queue (ft)	498	497	510	538	200	450	882	239	127	120	233	207
Average Queue (ft)	337	311	449	506	198	450	873	34	45	38	145	76
95th Queue (ft)	476	466	602	536	232	450	882	149	99	97	216	186
Link Distance (ft)	491	491	491	491			851	851	851	851	222	222
Upstream Blk Time (%)	1	1	11	55			56	0			1	0
Queuing Penalty (veh)	0	0	0	0			196	1			0	0
Storage Bay Dist (ft)					150	400						
Storage Blk Time (%)				39	23	81	0					2
Queuing Penalty (veh)				271	91	162	2					5

Intersection: 55: Route 1 Ramps & Rutherford Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	148
Average Queue (ft)	20
95th Queue (ft)	95
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 56: I-93 On-ramp/Chelsea Street & Rutherford Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	R	T	T	T	R	L	T	R
Maximum Queue (ft)	248	359	259	326	438	861	851	830	300	250	595	595
Average Queue (ft)	125	61	77	109	65	808	788	650	122	61	424	559
95th Queue (ft)	220	206	182	266	277	939	951	1005	323	224	820	651
Link Distance (ft)		851	851	851	851	810	810	810			565	565
Upstream Blk Time (%)				0		73	28	4			59	87
Queuing Penalty (veh)				1		0	0	0			0	0
Storage Bay Dist (ft)	200								250	200		
Storage Blk Time (%)	5	0						5	1	7	2	
Queuing Penalty (veh)	16	1						24	4	27	12	

Network Summary

Network wide Queuing Penalty: 910

VISSIM Output

Sullivan Square Analysis 01-30-2015	Existing VISSIM Analysis				Build Mitigated VISSIM Analysis				Build Mitigated Synchro Analysis			
Intersection/Movement	Observed Vehicles	Average Delay (sec)	LOS	Average Queue (ft)	Observed Vehicles	Average Delay (sec)	LOS	Average Queue (ft)	Observed Vehicles	Average Delay (sec)	LOS	Average Queue (ft)
Cambridge St/Alford St/Maffa Way	**3467**	**48.8**	**D**	**175.2**	**2945**	**43.5**	**D**	-	-	**48.6**	**D**	-
Cambridge St EB to Rutherford Ave SB	508	43.9	D	134.8	-	-	-	-	-	-	-	-
Cambridge St EB to Sullivan Traffic Circle	744	48.2	D	134.8	1028	26.8	C	89.7	1065	38.7	D	303
Maffa Way EB to Cambridge St WB	747	84.6	F	459.4	-	-	-	-	3			
Maffa Way EB to Rutherford Ave SB	219	37.9	D	46.8	449	55.0	D	234.7	1262	59.8	E	346
Maffa Way EB to Sullivan Traffic Circle	192	81.5	F	459.4	788	72.3	E	234.7				
Alford St SB to Cambridge St WB	41	49.6	D	68.3	520	18.7	B	28.1	533	32.0	C	82
Alford St SB to Rutherford Ave SB	845	13.4	B	29.5	29	47.5	D	43.8	339	64.7	E	121
Alford St SB to Sullivan Traffic Circle	170	61.2	E	68.3	131	59.0	E	43.8				
Cambridge St/I-93 Off Ramp	**2288**	**48.2**	D	**227.7**	**2189**	**20.4**	**C**	-	-	**26.1**	C	-
Cambridge St EB thru	642	58.8	E	108.8	495	21.7	C	47.2	727	19.5	B	168
Cambridge St EB to Cambridge St EB left-turn					220	26.7	C	47.2				
Cambridge St WB thru	1075	13.6	B	47.7	610	17.1	B	35.7	653	8.4	A	39
I-93 Off Ramp left to Cambridge St WB	252	81.6	F	374.1	335	20.6	C	54.3	331	41.6	D	280
I-93 Off Ramp right to Cambridge St EB	319	126.2	F	380.2	505	19.3	B	54.3	527	49.3	D	262
I-93 Offramp NB right to Cambridge St EB left-turn					16	25.5	C	54.3				
Busway SB right	-	-	-	-	7	51.9	D	3.6	7	48.7	D	0
NW Sullivan Square	**2677**	**17.8**	**C**	**47.8**	**2301**	**5.3**	**A**	-	-	-	-	-
Alford St SB to Main St WB	567	1.7	A	0.0	610	1.6	A	0.0	-	-	-	-
Alford St SB to Sullivan Traffic Circle	707	46.1	E	140.9	464	18.0	C	35.2	-	-	-	-
Sullivan Traffic Circle thru	1404	10.1	B	2.5	1227	2.5	A	0.0	-	-	-	-
Sullivan Square- Main St East	**2403**	**17.8**	**C**	**629.8**	**2852**	**14.3**	**B**	-	-	-	-	-
Main St WB to Sullivan Traffic Circle	552	64.1	F	1255.2	642	55.9	F	1189.0	-	-	-	-
Sullivan Traffic Circle thru	1851	3.9	A	4.4	2210	2.3	A	1.8	-	-	-	-
Sullivan Square- Rutherford Ave NB	**2526**	**33.6**	**D**	**730.2**	**2751**	**11.9**	**B**	-	-	-	-	-
Sullivan Traffic Circle thru	1660	1.6	A	4.1	1409	1.4	A	0.0	-	-	-	-
Sullivan Circle to Main St SB					533	2.7	A	0.0	-	-	-	-
Rutherford Ave NB to Sullivan Traffic Circle	867	95.0	F	1456.3	802	36.2	E	113.3	-	-	-	-
Rutherford Ave NB to Main St SB					6	24.5	C	113.3	-	-	-	-
Cambridge St/Spice St	-	-	-	-	**2175**	**23.7**	**C**	-	-	**16.8**	B	-
Cambridge St EB left	-	-	-	-	237	38.3	D	60.5	245	8.5	A	21
Cambridge St EB thru	-	-	-	-	784	13.1	B	35.8	800	2.2	A	47
Cambridge St EB right	-	-	-	-	215	10.6	B	35.8	224			
Cambridge St WB left					17	23.7	C	33.8	17			
Cambridge St WB thru	-	-	-	-	467	22.8	C	33.8	473	14.1	B	105
Cambridge St WB right					39	19.4	B	33.8	43			
Spice St NB left	-	-	-	-	11	49.6	D	63.2	10			
Spice St NB thru	-	-	-	-	1	42.1	D	63.2	2	45.8	D	59
Spice St NB right	-	-	-	-	253	44.0	D	63.2	261			
Busway SB left	-	-	-	-	0	0.0	A	35.5	1			
Busway St SB thru	-	-	-	-	12	52.0	D	35.5	11	85.2	F	38
Busway St SB right	-	-	-	-	140	41.4	D	35.5	179			
Beacham St at Main St Overall	-	-	-	-	**1953**	**7.6**	**A**	-	-	**23.2**	**C**	-
Main St WB left (BUS)	-	-	-	-	22	10.7	B	29.2	0	-	-	-
Main St WB thru	-	-	-	-	1594	7.3	A	29.2	1743	26.7	C	283
Beacham St NB left	-	-	-	-	332	9.0	A	14.7	288	1.9	A	0
Beacham St NB left (BUS)	-	-	-	-	5	9.5	A	14.7				
Beacham St NB thru	-	-	-	-	0	0.0	A	14.7	0	1.9	A	0
Maffa Way at Busway NORTH Overall	-	-	-	-	**1457**	**85.2**	**F**	-	-	4.4	A	-
Maffa Way EB thru	-	-	-	-	1360	88.8	F	576.2	1475	2.5	A	0
Maffa Way EB right	-	-	-	-	28	49.3	D	576.2	27			
Busway SB thru	-	-	-	-	42	30.5	C	1.7	29	101.7	F	7
Busway NB right	-	-	-	-	28	31.2	C	6.6	40	-	-	-
Maffa Way at Busway SOUTH Overall	-	-	-	-	**1728.4**	**40.9**	**D**	-	-	9.9	A	-
Maffa Way EB left	-	-	-	-	9	22.0	C	3.8	22			
Maffa Way EB thru	-	-	-	-	316	18.8	B	13.7	1254	7.7	A	100
Maffa Way EB right	-	-	-	-	23	34.1	C	219.5	199			
Busway NB thru	-	-	-	-	1223	49.4	D	219.5	266	21.8	C	83
Busway NB right	-	-	-	-	158	21.3	C	219.5	10			

B.9 Parking Analysis

a. Shared Parking Analysis Worksheets
b. Parking Demand Tables

Shared Parking Analysis Worksheets

Supplemental Final EIR
Wynn Everett
Everett, Massachusetts

Base Parking Requirements - 12/3/14 Program Change
ULI Shared Parking

		Parking Ratios - Weekday		Base Parking Demand-Weekday		Parking Ratios - Weekday		Base Parking Demand-Weekend	
Land Use	Size	Patron	Employee	Patron	Employee	Patron	Employee	Patron	Employee
Hotel - Leisure	629 rooms	0.90 /room	0.25 /room	567	158	1.00 /room	0.18 /room	629	114
Convention Center	37,068 sf gla	20.00 /ksf	-- /ksf	742	0	10.00 /ksf	-- /ksf	371	0
Conference Center	0 sf gla	30.00 /ksf	-- /ksf	0	0	30.00 /ksf	-- /ksf	0	0
Retail	51,783 sf gla	2.90 /ksf	0.70 /ksf	151	37	3.20 /ksf	0.80 /ksf	166	42
Fine Dining	17,277 sf gla	15.25 /ksf	2.75 /ksf	264	48	17.00 /ksf	3.00 /ksf	294	52
Fast-Food Restaurant	6,216 sf gla	12.75 /ksf	2.25 /ksf	80	14	12.00 /ksf	2.00 /ksf	75	13
Family Restaurant	40,334 sf gla	9.00 /ksf	1.50 /ksf	364	61	12.75 /ksf	2.25 /ksf	515	91
Nightclub	0 sf gla	15.25 /ksf	1.25 /ksf	0	0	17.50 /ksf	1.50 /ksf	0	0
Casino*	190,461 sf	10.94 /ksf	2.79 /ksf	2,084	532	12.03 /ksf	2.71 /ksf	2,292	517
Spa**	15,405 sf	6.60 /ksf	0.40 /ksf	102	7	5.50 /ksf	0.25 /ksf	85	4
			Total Required	4,354	857			4,427	833
			Parking Provided	3,400				3,400	

*Based on Walker Parking Consultants.
**Based on Health Club.

Weekday Shared Parking Analysis - ULI

	Customer/ Visitor/	Employee	Total
Fine/Casual Dining	264	48	312
Family Restaurant	364	61	425
Retail	151	37	188
Fast Food Restaurant	80	14	94
Spa (Health Club)	102	7	109
Hotel - Leisure	567	158	725
Hotel Conference/Banquet	0	0	0
Hotel Convention Space	742	0	742
Nightclub	0	0	0
Casino	2084	532	2616
Total	4354	857	5211

Recommended Monthly Adjustment Factors for Customer/Visitor Parking

	January	February	March	April	May	June	July	August	September	October	November	December	Late December
Fine/Casual Dining	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Family Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Retail	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Fast Food Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Spa (Health Club)	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	90%	95%
Hotel - Leisure	90%	100%	100%	100%	90%	90%	100%	100%	75%	75%	75%	50%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	60%
Nightclub	84%	86%	98%	90%	90%	91%	94%	96%	92%	98%	96%	100%	95%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Recommended Monthly Adjustment Factors for Employee Parking

	January	February	March	April	May	June	July	August	September	October	November	December	Late December
Fine/Casual Dining	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Retail	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
Fast Food Restaurant	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spa (Health Club)	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	100%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub	90%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Recommended Time of Day Factors for Weekdays - Customer/Visitor

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	90%	95%	100%	90%	90%	90%	50%
Family Restaurant	25%	50%	60%	75%	85%	90%	100%	90%	50%	45%	45%	75%	80%	80%	80%	60%	55%	50%	25%
Retail	1%	5%	15%	35%	65%	85%	95%	100%	95%	90%	90%	95%	95%	95%	80%	50%	30%	10%	0%
Fast Food Restaurant	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%
Spa (Health Club)	70%	40%	40%	70%	70%	80%	60%	70%	70%	70%	80%	90%	100%	90%	80%	70%	35%	10%	0%
Hotel - Leisure	95%	95%	90%	80%	70%	70%	65%	65%	70%	70%	75%	80%	85%	85%	90%	95%	95%	100%	100%
Hotel Conference/Banquet	0%	0%	30%	60%	60%	60%	65%	65%	65%	65%	65%	100%	100%	100%	100%	100%	50%	0%	0%
Hotel Convention Space	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
Nightclub	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	50%	100%	100%	100%	100%
Casino	14%	13%	11%	18%	28%	40%	65%	79%	79%	75%	72%	65%	78%	89%	89%	95%	100%	97%	93%
Retail - Peak Dec	1%	5%	15%	30%	55%	75%	90%	100%	100%	100%	95%	85%	80%	75%	65%	50%	30%	10%	0%
Retail - Late Dec	1%	5%	10%	20%	40%	65%	90%	100%	100%	100%	95%	85%	70%	55%	40%	25%	15%	5%	0%

Recommended Time of Day Factors for Weekdays - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	0%	0%	0%	0%	0%	0%	0%	0%	20%	50%	75%	90%	100%	100%	100%	100%	100%	85%	50%
Family Restaurant	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%
Retail	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	95%	95%	90%	75%	40%	15%	0%
Fast Food Restaurant	15%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%
Spa (Health Club)	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	100%	100%	75%	50%	20%	20%	20%	0%
Hotel - Leisure	5%	30%	90%	90%	100%	100%	100%	100%	100%	100%	90%	70%	40%	20%	20%	20%	20%	10%	5%
Hotel Conference/Banquet	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hotel Convention Space	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Nightclub	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	100%	100%
Casino	29%	29%	32%	32%	37%	43%	50%	74%	79%	84%	84%	85%	76%	71%	73%	73%	73%	71%	68%

Noncaptive Adjustment Factors - Customers/Visitors

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Family Restaurant	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Retail	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Fast Food Restaurant	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Spa (Health Club)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Hotel Convention Space	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Nightclub	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Noncaptive Adjustment Factors - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Retail	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fast Food Restaurant	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spa (Health Club)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Mode Adjustment Factors - Customers

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Family Restaurant	71%	83%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Retail	71%	63%	63%	63%	83%	63%	63%	83%	63%	63%	63%	83%	63%	71%	71%	71%	71%	71%	71%
Fast Food Restaurant	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Spa (Health Club)	71%	63%	63%	83%	83%	83%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel - Leisure	71%	63%	63%	63%	63%	83%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel Conference/Banquet	71%	63%	83%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel Convention Space	71%	63%	63%	63%	63%	83%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Nightclub	71%	63%	83%	63%	83%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Casino	71%	63%	83%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%

Mode Adjustment Factors - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Family Restaurant	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Retail	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Fast Food Restaurant	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Spa (Health Club)	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel - Leisure	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel Conference/Banquet	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel Convention Space	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Nightclub	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Casino	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%

Shared Parking Analysis - January

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	81	121	144	151	136	136	136	76
Family Restaurant	44	78	94	117	133	140	156	140	78	70	70	117	125	141	141	105	97	68	44
Retail	1	3	8	18	33	43	48	51	48	46	46	48	48	54	46	29	17	6	0
Fast Food Restaurant	1	2	4	8	12	18	21	21	19	13	12	13	18	19	12	7	5	2	1
Spa (Health Club)	30	15	15	27	27	31	23	27	27	27	31	35	39	39	35	30	15	4	0
Hotel - Leisure	344	305	289	257	225	225	209	209	225	225	241	257	273	308	326	344	344	362	362
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	140	280	280	280	280	280	280	280	280	280	140	95	95	32	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,460	1,436	1,376
TOTAL, CUSTOMERS	627	574	697	943	1,072	1,266	1,596	1,766	1,713	1,644	1,621	1,688	1,784	2,112	2,126	2,087	2,094	2,035	1,859
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	9	14	17	19	26	26	26	26	22	13
Family Restaurant	17	18	21	21	24	24	24	24	24	18	18	23	23	32	32	27	22	22	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	106	157	162	185	202	217	269	284	294	292	289	253	323	323	315	303	279	241

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - February

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	82	122	145	153	138	138	138	77
Family Restaurant	44	79	95	118	134	142	158	142	79	71	71	118	126	142	142	107	98	89	44
Retail	1	3	8	18	33	44	49	52	49	46	46	49	49	55	46	29	17	6	0
Fast Food Restaurant	1	2	4	7	12	18	22	22	20	13	12	13	18	20	12	7	5	2	1
Spa (Health Club)	29	15	15	26	26	29	22	26	26	26	29	33	37	37	33	29	14	4	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	187	374	374	374	374	374	374	374	374	374	187	126	126	42	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1 403	1,480	1,436	1,376
TOTAL, CUSTOMERS	664	609	777	1,065	1,191	1,385	1 714	1,884	1,832	1,763	1,741	1,811	1,863	2,180	2,197	2,137	2,134	2,077	1,901
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	9	14	17	19	26	26	26	26	22	13
Family Restaurant	17	18	21	21	24	24	24	24	24	18	18	23	23	32	32	27	22	22	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	106	157	162	185	202	217	269	284	294	292	289	253	323	323	315	303	279	241

Shared Parking Analysis - March

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	90	135	161	169	152	152	152	85
Family Restaurant	49	87	105	131	148	157	174	157	87	78	78	131	139	157	157	118	108	98	49
Retail	1	3	9	20	38	49	55	58	55	52	52	55	55	62	52	33	20	7	0
Fast Food Restaurant	1	2	5	7	13	20	24	24	22	14	13	14	20	22	13	8	5	3	1
Spa (Health Club)	26	13	13	23	23	26	20	23	23	23	26	29	33	33	30	26	13	4	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	168	337	337	337	337	337	337	337	337	337	168	114	114	38	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1 020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	666	616	768	1 040	1,170	1,367	1,700	1,868	1,808	1,737	1,715	1,799	1,874	2,202	2,218	2,160	2,160	2,102	1,914
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	187	204	218	271	285	296	294	291	255	326	326	318	306	281	243

Shared Parking Analysis - April

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	87	131	156	164	147	147	147	82
Family Restaurant	48	84	101	127	143	152	169	152	84	76	76	127	135	152	152	114	105	95	48
Retail	1	3	9	20	37	48	54	57	54	51	51	54	54	61	51	32	19	6	0
Fast Food Restaurant	1	2	5	7	13	20	23	23	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	21	11	11	19	19	22	16	19	19	19	22	24	27	27	24	21	11	3	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	103	206	206	206	206	206	206	206	206	206	103	70	70	23	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	659	611	697	901	1,030	1,225	1,558	1,726	1,869	1,599	1,576	1,654	1,793	2,140	2,157	2,131	2,149	2,093	1,909
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	296	293	290	254	326	326	318	306	281	243

Shared Parking Analysis - May

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	91	137	162	171	154	154	154	85
Family Restaurant	50	88	106	132	150	159	176	159	88	79	79	132	141	159	159	119	109	99	50
Retail	1	3	9	21	39	51	57	60	57	54	54	57	57	64	54	34	20	7	0
Fast Food Restaurant	1	2	5	7	13	21	24	24	22	15	13	15	21	22	14	8	5	3	1
Spa (Health Club)	20	10	10	18	18	20	15	18	18	18	20	23	25	25	23	20	10	3	0
Hotel - Leisure	344	305	289	257	225	225	209	209	225	225	241	257	273	308	326	344	344	362	362
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	112	224	224	224	224	224	224	224	224	224	112	76	76	25	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	622	580	678	896	1,031	1,227	1,563	1,730	1,668	1,597	1,573	1,655	1,785	2,128	2,142	2,107	2,122	2,063	1,875
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	295	293	290	254	326	325	318	306	281	243

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - June

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	90	135	161	169	152	152	152	85
Family Restaurant	49	87	105	131	148	157	174	157	87	78	78	131	139	157	157	118	108	98	49
Retail	1	3	9	21	39	51	58	61	58	54	54	58	58	65	55	34	20	7	0
Fast Food Restaurant	1	2	5	7	13	20	24	24	22	14	13	14	20	22	13	8	5	3	1
Spa (Health Club)	20	10	10	18	18	20	15	18	18	18	20	23	25	25	23	20	10	3	0
Hotel - Leisure	344	305	289	257	225	225	209	209	225	225	241	257	273	308	326	344	344	362	362
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	93	187	187	187	187	187	187	187	187	187	93	63	63	21	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	621	579	658	858	992	1,189	1,525	1,692	1,631	1,560	1,535	1,615	1,764	2,113	2,127	2,100	2,120	2,061	1,873
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	295	293	290	254	326	325	318	306	281	243

Shared Parking Analysis - July

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	93	139	166	175	157	157	157	87
Family Restaurant	51	90	108	135	153	162	180	162	90	81	81	135	144	162	162	122	111	101	51
Retail	1	3	9	20	38	49	55	58	55	52	52	55	55	62	52	33	20	7	0
Fast Food Restaurant	1	2	5	7	14	21	25	25	22	15	14	15	21	22	14	8	6	3	1
Spa (Health Club)	20	10	10	18	18	20	15	18	18	18	20	23	25	25	23	20	10	3	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	84	168	168	168	168	168	168	168	168	168	84	57	57	19	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	681	616	684	871	1,002	1,198	1,533	1,700	1,638	1,567	1,544	1,631	1,792	2,148	2,165	2,144	2,166	2,109	1,918
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	295	293	290	254	326	325	318	306	281	243

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - August

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	94	141	167	176	159	159	159	88
Family Restaurant	51	91	109	136	154	163	182	183	91	82	82	136	145	164	164	123	113	102	51
Retail	1	3	9	22	41	53	59	62	59	56	56	59	59	67	56	35	21	7	0
Fast Food Restaurant	1	2	5	7	14	21	25	25	22	15	14	15	21	22	14	8	6	3	1
Spa (Health Club)	21	11	11	19	19	22	16	19	19	19	22	24	27	27	24	21	11	3	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	140	280	280	280	280	280	280	280	280	280	140	95	95	32	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	663	618	743	988	1,120	1,318	1,653	1,820	1,757	1,685	1,662	1,752	1,857	2,197	2,213	2,163	2,171	2,112	1,919
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	296	293	290	254	326	326	318	306	281	243

Shared Parking Analysis - September

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	86	129	154	162	146	146	146	81
Family Restaurant	47	83	100	125	142	150	167	150	83	75	75	125	134	151	151	113	103	94	47
Retail	1	3	9	20	38	49	55	58	55	52	52	55	55	62	52	33	20	7	0
Fast Food Restaurant	1	2	5	7	13	19	23	23	21	14	13	14	19	21	13	8	5	3	1
Spa (Health Club)	24	12	12	22	22	25	19	22	22	22	25	28	31	31	28	24	12	3	0
Hotel - Leisure	287	255	241	214	188	188	174	174	188	188	201	214	228	257	272	287	287	302	302
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	150	299	299	299	299	299	299	299	299	299	150	101	101	34	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,435	1,376
TOTAL, CUSTOMERS	566	526	663	924	1,062	1,259	1,595	1,763	1,702	1,632	1,606	1,678	1,765	2,088	2,099	2,047	2,053	1,990	1,807
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	186	203	218	270	285	296	294	291	255	326	326	318	306	281	243

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - October

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	91	137	162	171	154	154	154	85
Family Restaurant	50	88	106	132	150	159	176	159	88	79	79	132	141	159	159	119	109	99	50
Retail	1	3	9	21	39	51	57	60	57	54	54	57	57	64	54	34	20	7	0
Fast Food Restaurant	1	2	5	7	13	21	24	24	22	15	13	15	21	22	14	8	5	3	1
Spa (Health Club)	26	13	13	23	23	26	20	23	23	23	26	29	33	33	30	26	13	4	0
Hotel - Leisure	287	255	241	214	188	188	174	174	188	188	201	214	228	257	272	287	287	302	302
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	159	318	318	318	318	318	318	318	318	318	159	107	107	36	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	571	532	680	952	1,092	1,289	1,627	1,795	1,730	1,659	1,632	1,713	1,794	2,116	2,127	2,066	2,068	2,004	1,814
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	9	10	12	12	12	12	12	12	12	12	16	15	13	7	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	85	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	118	107	158	163	187	204	218	271	285	296	294	291	255	326	326	318	306	281	243

Shared Parking Analysis - November

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	88	132	157	166	149	149	149	83
Family Restaurant	48	85	102	128	145	154	171	154	85	77	77	128	136	154	154	115	106	96	48
Retail	1	3	10	23	42	55	62	65	62	59	59	62	62	70	59	37	22	7	0
Fast Food Restaurant	1	2	5	7	13	20	23	23	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	26	13	13	23	23	26	20	23	23	23	26	29	33	33	30	26	13	4	0
Hotel - Leisure	287	255	241	214	188	188	174	174	188	188	201	214	228	257	272	287	287	302	302
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	187	374	374	374	374	374	374	374	374	374	187	126	126	42	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	569	530	705	1,006	1,147	1,344	1,682	1,850	1,788	1,717	1,690	1,767	1,818	2,130	2,140	2,067	2,061	1,996	1,810
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	10	12	13	14	14	14	14	14	13	13	18	17	14	8	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	119	107	159	164	188	205	220	272	283	288	280	274	237	301	300	292	279	258	229

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	95	142	169	178	160	160	160	89
Family Restaurant	52	92	110	138	156	165	183	165	92	83	83	138	147	165	185	124	114	103	52
Retail	1	5	14	32	59	77	86	90	86	81	81	86	86	97	81	51	31	10	0
Fast Food Restaurant	1	3	5	8	14	21	25	25	23	15	14	15	21	23	14	9	6	3	1
Spa (Health Club)	27	14	14	24	24	28	21	24	24	24	28	31	35	35	31	27	14	4	0
Hotel - Leisure	191	170	161	143	125	125	116	116	125	125	134	143	152	171	181	191	191	201	201
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	112	224	224	224	224	224	224	224	224	224	112	76	76	25	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,436	1,376
TOTAL, CUSTOMERS	479	453	562	805	964	1,168	1,514	1,683	1,609	1,535	1,505	1,589	1,715	2,048	2,048	1,991	1,995	1,918	1,719
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	6	11	13	14	15	15	15	15	15	14	14	20	19	16	9	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	186	220	224	227	227	220	210
TOTAL, EMPLOYEES	119	108	160	166	188	207	222	274	284	289	282	276	238	303	302	293	280	258	229

Shared Parking Analysis - Peak December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	95	142	169	178	160	160	160	89
Family Restaurant	52	92	110	138	156	165	183	165	92	83	83	138	147	165	165	124	114	103	52
Retail	1	5	14	32	59	77	86	90	86	81	81	86	86	97	81	51	31	10	0
Fast Food Restaurant	1	3	5	8	14	21	25	25	23	15	14	15	21	23	14	9	6	3	1
Spa (Health Club)	27	14	14	24	24	28	21	24	24	24	28	31	35	35	31	27	14	4	0
Hotel - Leisure	191	170	161	143	125	125	116	116	125	125	134	143	152	171	181	191	191	201	201
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	112	224	224	224	224	224	224	224	224	224	112	76	76	25	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1,403	1,480	1,435	1,376
TOTAL, CUSTOMERS	479	453	562	805	964	1,168	1,514	1,683	1,609	1,538	1,505	1,589	1,715	2,048	2,048	1,991	1,995	1,918	1,719
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	6	11	13	14	15	15	15	15	15	14	14	20	19	16	9	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	8	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	69	69	80	94	109	161	172	184	184	186	166	220	224	227	227	220	210
TOTAL, EMPLOYEES	119	108	160	166	189	207	222	274	284	289	282	276	238	303	302	293	280	258	229

Supplemental Final EIR
Wynn Everett
Weekday Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - Late December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	90	135	161	169	152	152	152	85
Family Restaurant	49	87	105	131	148	157	174	157	87	78	78	131	139	157	157	118	108	98	49
Retail	1	4	7	14	29	47	65	72	72	72	69	61	51	45	33	20	12	4	0
Fast Food Restaurant	1	2	5	7	13	20	24	24	22	14	13	14	20	22	13	8	5	3	1
Spa (Health Club)	29	15	15	26	26	29	22	26	26	26	29	33	37	37	33	29	14	4	0
Hotel - Leisure	382	339	321	286	250	250	232	232	250	250	268	286	304	342	362	382	382	403	403
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	112	224	224	224	224	224	224	224	224	224	112	76	76	25	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	206	171	147	237	362	528	858	1,037	1,035	983	941	857	1,020	1,312	1,321	1 403	1 480	1,436	1,376
TOTAL, CUSTOMERS	669	618	712	925	1,052	1,256	1,600	1,773	1,716	1 648	1,623	1,697	1 818	2 151	2,164	2 138	2,154	2 100	1 914
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	4	10	15	18	20	28	28	28	28	24	14
Family Restaurant	18	19	23	23	25	25	25	25	25	19	19	24	24	34	34	28	23	23	12
Retail	2	2	5	10	12	13	14	14	14	14	14	13	13	18	17	14	8	3	0
Fast Food Restaurant	1	1	2	2	4	6	6	6	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	3	2	2	2	2	2	2	2	2	2	2	3	3	3	2	1	1	1	0
Hotel - Leisure	5	19	58	58	65	65	65	65	65	65	58	45	26	18	18	18	18	9	5
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	84	69	69	80	94	109	161	172	184	184	186	165	220	224	227	227	220	210
TOTAL, EMPLOYEES	119	107	159	165	188	205	220	272	283	288	281	275	237	301	300	292	279	258	229

Total Weekday Shared Parking Demand - Patrons

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
January	627	[illegible]	697	943	1,072	1,266	1,596	1 766	1 713	1,644	1,621	1,688	1,784	2,112	2,126	2,087	2,094	2,035	1,859
February	664	609	777	1,065	1,191	1,385	1,714	1 884	1 832	1,763	1,741	1,812	1,863	2,180	2,197	2,137	2,134	2,077	1,901
March	666	614	768	1,040	1,170	1,367	1,700	1 868	1 808	1,737	1,715	1,799	1,874	2,202	2,218	2,160	2,160	2,102	1,914
April	659	611	697	901	1,030	1,225	1,558	1 726	1 669	1,599	1,576	1,654	1,793	2,140	2,157	2,131	2,149	2,093	1,909
May	622	540	678	896	1,031	1,227	1,563	1 730	1 668	1,597	1,573	1,655	1,785	2,128	2,142	2,107	2,122	2,063	1,875
June	621	579	658	858	992	1,189	1,525	1 692	1 631	1,560	1,535	1,616	1,764	2,113	2,127	2,100	2,120	2,061	1,873
July	661	614	684	871	1,002	1,198	1,533	1 700	1 638	1,567	1,544	1,631	1,792	2,148	2,165	2,144	2,166	2,109	1,918
August	663	618	743	988	1,120	1,318	1,653	1 820	1 757	1,685	1,662	1,752	1,857	2,197	2,213	2,163	2,171	2,112	1,919
September	566	576	663	924	1,062	1,258	1,595	1 763	1 702	1,632	1,606	1,678	1,765	2,088	2,099	2,047	2,053	1,990	1,807
October	571	532	680	952	1,092	1,289	1,627	1 795	1 730	1,659	1,632	1,713	1,794	2,116	2,127	2,066	2,068	2,004	1,814
November	569	530	705	1,006	1,147	1,344	1,682	1 850	1 788	1,717	1,690	1,767	1,818	2,130	2,140	2,067	2,061	1,996	1,810
December	479	451	562	805	964	1,168	1,514	1 683	1 609	1,536	1,505	1,589	1,715	2,048	2,048	1,991	1,995	1,918	1,719
Peak December	479	451	562	805	964	1,168	1,514	1 683	1 609	1,536	1,505	1,589	1,715	2,048	2,048	1,991	1,995	1,918	1,719
Late December	669	618	712	925	1,052	1,256	1,600	1 773	1 716	1,648	1,623	1,697	1,818	2,151	2,164	2,138	2,154	2,100	1,914

Shared Parking Maximum Demand, Patrons	2,218
Parking Supply	3,400
Surplus/Deficit	1,182

Total Weekday Shared Parking Demand - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
January	118	104	157	162	185	202	217	269	244	294	292	289	253	324	323	315	303	279	241
February	118	106	157	162	185	202	217	269	244	294	292	289	253	324	323	315	303	279	241
March	118	107	158	163	187	204	218	271	245	296	294	291	255	324	326	318	306	281	243
April	118	107	158	163	186	203	218	270	245	296	293	290	255	324	326	318	306	281	243
May	118	107	158	163	186	203	218	270	245	295	293	290	254	325	325	318	306	281	243
June	118	107	158	163	186	203	218	270	245	295	293	290	254	326	325	318	306	281	243
July	118	107	158	163	186	203	218	270	245	295	293	290	254	326	325	318	306	281	243
August	118	107	158	163	186	203	218	270	245	296	293	290	254	326	326	318	306	281	243
September	118	107	158	163	186	203	218	270	245	296	294	291	255	326	326	318	306	281	243
October	118	107	158	163	187	204	218	271	245	296	294	291	255	326	326	318	306	281	243
November	119	107	159	164	188	205	220	272	241	288	280	274	217	301	300	293	279	258	229
December	119	108	160	166	189	207	222	274	244	289	282	276	218	304	302	293	260	258	229
Peak December	119	104	160	166	189	207	222	274	244	289	282	276	218	303	302	293	280	258	229
Late December	119	107	159	165	188	205	220	272	241	288	281	275	217	301	300	292	279	258	229

Maximum Demand, Employees	326

Weekend Shared Parking Analysis - ULI

	Customer/ Visitor/ Resident	Employee	Total
Fine/Casual Dining	294	52	346
Family Restaurant	515	91	606
Retail	166	42	208
Fast Food Restaurant	75	13	88
Spa (Health Club)	85	4	89
Hotel - Leisure	629	114	743
Hotel Conference/Banquet	0	0	0
Hotel Convention Space	371	0	371
Nightclub	0	0	0
Casino	2,292	517	2,809
Total	4,427	833	5,260

Recommended Monthly Adjustment Factors for Customer/Visitor Parking

	January	February	March	April	May	June	July	August	September	October	November	December	Late December
Fine/Casual Dining	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Family Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Retail	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%
Fast Food Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%
Spa (Health Club)	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	90%	95%
Hotel - Leisure	90%	100%	100%	100%	90%	90%	100%	100%	75%	75%	75%	50%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	60%
Nightclub	84%	86%	98%	90%	90%	91%	94%	96%	92%	98%	96%	100%	95%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Recommended Monthly Adjustment Factors for Employee Parking

	January	February	March	April	May	June	July	August	September	October	November	December	Late December
Fine/Casual Dining	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Retail	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%
Fast Food Restaurant	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spa (Health Club)	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	100%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub	90%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Recommended Time of Day Factors for Weekends - Customer/Visitor

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	90%	95%	100%	90%	90%	90%	50%
Family Restaurant	10%	25%	45%	70%	90%	90%	100%	85%	65%	40%	45%	60%	70%	70%	65%	30%	25%	15%	10%
Retail	1%	5%	10%	30%	50%	65%	80%	90%	100%	100%	95%	90%	80%	75%	65%	50%	35%	15%	0%
Fast Food Restaurant	5%	10%	20%	30%	55%	85%	100%	100%	90%	60%	55%	60%	85%	80%	50%	30%	20%	10%	5%
Spa (Health Club)	80%	45%	35%	50%	35%	50%	50%	30%	25%	30%	55%	100%	95%	60%	30%	10%	1%	1%	0%
Hotel - Leisure	95%	95%	90%	80%	70%	70%	65%	65%	70%	70%	75%	80%	85%	85%	90%	95%	95%	100%	100%
Hotel Conference/Banquet	0%	0%	30%	60%	60%	60%	65%	65%	65%	65%	65%	100%	100%	100%	100%	100%	50%	0%	0%
Hotel Convention Space	0%	0%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	30%	30%	10%	0%	0%	0%
Nightclub	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	50%	100%	100%	100%	100%
Casino	14%	13%	11%	18%	30%	46%	74%	81%	100%	83%	78%	82%	89%	89%	85%	86%	91%	88%	85%
Retail - Peak Dec	1%	5%	10%	35%	60%	70%	85%	95%	100%	100%	95%	90%	80%	75%	65%	50%	35%	15%	0%
Retail - Late Dec	1%	5%	10%	20%	40%	60%	80%	95%	100%	100%	95%	85%	70%	60%	50%	30%	20%	10%	0%

Recommended Time of Day Factors for Weekends - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	75%	90%	100%	100%	100%	100%	100%	85%	50%
Family Restaurant	50%	75%	90%	90%	100%	100%	100%	100%	100%	75%	75%	95%	95%	95%	95%	80%	65%	65%	35%
Retail	10%	15%	40%	75%	85%	95%	100%	100%	100%	100%	100%	95%	85%	80%	75%	65%	45%	15%	0%
Fast Food Restaurant	15%	20%	30%	40%	75%	100%	100%	100%	95%	70%	60%	70%	90%	90%	60%	40%	30%	20%	20%
Spa (Health Club)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	75%	100%	100%	75%	50%	20%	20%	20%	0%
Hotel - Leisure	5%	30%	90%	90%	100%	100%	100%	100%	100%	100%	90%	75%	60%	55%	55%	55%	45%	45%	30%
Hotel Conference/Banquet	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Hotel Convention Space	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Nightclub	0%	0%	0%	5%	5%	5%	5%	10%	10%	10%	20%	45%	70%	100%	100%	100%	100%	100%	100%
Casino	30%	30%	30%	30%	35%	42%	49%	73%	78%	85%	85%	85%	78%	74%	75%	76%	76%	74%	70%

Noncaptive Adjustment Factors - Customers/Residents

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Family Restaurant	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Retail	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Fast Food Restaurant	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Spa (Health Club)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Hotel Convention Space	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Nightclub	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Noncaptive Adjustment Factors - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Restaurant	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Retail	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fast Food Restaurant	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spa (Health Club)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel - Leisure	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Conference/Banquet	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hotel Convention Space	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Nightclub	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Casino	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Mode Adjustment Factors - Customers/Visitors

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Family Restaurant	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Retail	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Fast Food Restaurant	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Spa (Health Club)	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel - Leisure	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel Conference/Banquet	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Hotel Convention Space	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Nightclub	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%
Casino	71%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	71%	71%	71%	71%	71%	71%

Mode Adjustment Factors - Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Fine/Casual Dining	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Family Restaurant	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Retail	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Fast Food Restaurant	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Spa (Health Club)	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel - Leisure	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel Conference/Banquet	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Hotel Convention Space	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Nightclub	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%
Casino	58%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	58%	58%	58%	58%	58%	58%

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - January

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	90	135	160	169	152	152	152	84
Family Restaurant	25	55	99	154	199	199	221	188	143	88	99	132	154	174	162	75	62	37	25
Retail	1	3	6	17	28	36	45	50	56	56	53	50	45	47	41	31	22	9	0
Fast Food Restaurant	1	2	4	6	11	17	20	20	18	12	11	12	17	18	11	7	5	2	1
Spa (Health Club)	29	14	11	16	11	16	16	10	8	10	18	32	31	22	11	4	0	0	0
Hotel - Leisure	382	339	321	285	250	250	232	232	250	250	267	285	303	342	362	382	382	402	402
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	70	140	140	140	140	140	140	140	140	140	70	47	47	16	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	666	603	674	882	1,066	1,320	1,745	1,809	2,059	1,748	1,720	1,921	2,034	2,259	2,193	2,070	2,103	2,040	1,889
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	15	18	20	29	29	29	29	24	14
Family Restaurant	25	27	32	32	35	35	35	35	35	27	27	34	34	48	48	40	33	33	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	6	4	3	2	1	1
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	123	108	146	151	174	190	206	257	268	274	281	285	266	357	357	348	329	312	264

Shared Parking Analysis - February

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	91	136	162	171	153	153	153	85
Family Restaurant	25	56	100	156	201	201	223	190	145	89	100	134	156	176	164	75	63	38	25
Retail	1	3	6	17	28	37	45	51	57	57	54	51	45	48	41	32	22	10	0
Fast Food Restaurant	1	2	4	8	11	17	20	20	18	12	11	12	17	18	11	7	5	2	1
Spa (Health Club)	28	14	11	15	11	15	15	9	8	9	17	31	29	21	10	3	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	93	187	187	187	187	187	187	187	187	187	93	63	63	21	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	708	641	734	962	1,143	1,397	1,820	1,885	2,138	1,824	1,798	2,001	2,094	2,317	2,253	2,121	2,149	2,087	1,935
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	15	18	20	29	29	29	29	24	14
Family Restaurant	25	27	32	32	35	35	35	35	35	27	27	34	34	48	48	40	33	33	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	6	4	3	2	1	1
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	123	108	146	151	174	190	206	257	268	274	281	285	266	357	357	348	329	312	264

Shared Parking Analysis - March

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	100	150	179	188	170	170	170	94
Family Restaurant	28	62	111	173	222	222	247	210	160	99	111	148	173	195	181	83	69	42	28
Retail	1	3	6	19	32	41	51	57	64	64	60	57	51	54	47	36	25	11	0
Fast Food Restaurant	1	2	4	7	12	19	22	22	20	13	12	13	19	20	13	8	5	3	1
Spa (Health Club)	25	12	10	14	10	14	14	8	7	8	15	27	26	18	9	3	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	84	168	168	168	168	168	168	168	168	168	84	57	57	19	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	708	646	735	961	1,149	1,404	1,631	1,893	2,141	1,822	1,796	2,010	2,120	2,352	2,287	2,147	2,174	2,108	1,947
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	176	192	208	259	270	276	284	288	269	361	361	352	333	315	265

Shared Parking Analysis - April

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	97	146	173	182	164	164	164	91
Family Restaurant	27	60	107	167	215	215	239	203	155	96	107	143	167	188	175	81	67	40	27
Retail	1	3	6	19	31	41	50	56	63	63	59	56	50	53	46	35	25	11	0
Fast Food Restaurant	1	2	4	7	12	18	22	22	20	13	12	13	18	20	12	7	5	2	1
Spa (Health Club)	20	10	8	11	8	11	11	7	6	7	12	22	21	15	8	3	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	51	103	103	103	103	103	103	103	103	103	51	35	35	12	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	702	642	697	887	1,074	1,323	1,754	1,818	2,067	1,751	1,723	1,931	2,071	2,313	2,250	2,130	2,166	2,101	1,943
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	208	259	270	275	283	288	269	361	361	352	333	315	265

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - May

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	101	152	181	190	171	171	171	95
Family Restaurant	28	62	112	174	224	224	249	212	162	100	112	150	174	197	183	84	70	42	28
Retail	1	3	7	20	33	43	52	59	66	66	62	59	52	55	48	37	26	11	0
Fast Food Restaurant	1	2	5	7	12	19	23	23	20	14	12	14	19	20	13	8	5	3	1
Spa (Health Club)	19	9	7	10	7	10	10	6	5	6	11	21	20	14	7	2	0	0	0
Hotel - Leisure	382	339	321	285	250	250	232	232	250	250	267	285	303	342	362	382	382	402	402
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	56	112	112	112	112	112	112	112	112	112	56	38	38	13	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	253	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	660	606	671	872	1,066	1,321	1,750	1,814	2,059	1,740	1,710	1,921	2,057	2,296	2,231	2,101	2,135	2,066	1,903
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	207	259	270	275	283	288	269	361	361	352	333	315	265

Shared Parking Analysis - June

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	100	150	179	188	170	170	170	94
Family Restaurant	28	62	111	173	222	222	247	210	160	99	111	148	173	195	181	83	69	42	28
Retail	1	3	7	20	33	43	53	60	67	67	63	60	53	56	49	38	26	11	0
Fast Food Restaurant	1	2	4	7	12	19	22	22	20	13	12	13	19	20	13	8	5	3	1
Spa (Health Club)	19	9	7	10	7	10	10	6	5	6	11	21	20	14	7	2	0	0	0
Hotel - Leisure	382	339	321	285	250	250	232	232	250	250	267	285	303	342	362	382	382	402	402
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	47	93	93	93	93	93	93	93	93	93	47	32	32	11	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	153	253	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	659	606	650	852	1,045	1,300	1,730	1,793	2,039	1,721	1,691	1,900	2,045	2,287	2,221	2,097	2,133	2,064	1,902
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	207	259	270	275	283	288	269	361	361	352	333	315	265

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - July

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	103	155	185	194	175	175	175	97
Family Restaurant	29	64	114	178	229	229	254	216	165	102	114	153	178	201	186	86	72	43	29
Retail	1	3	6	19	32	41	51	57	64	64	60	57	51	54	47	36	25	11	0
Fast Food Restaurant	1	2	5	7	13	20	23	23	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	19	9	7	10	7	10	10	6	5	6	11	21	20	14	7	2	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	42	84	84	84	84	84	84	84	84	84	42	28	28	9	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	703	645	695	879	1,070	1,324	1,752	1,814	2,060	1,740	1,712	1,928	2,082	2,331	2,268	2,145	2,182	2,115	1,951
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	207	259	270	275	283	288	269	361	361	352	333	315	265

Shared Parking Analysis - August

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	105	157	187	196	177	177	177	98
Family Restaurant	29	64	116	180	231	231	257	218	167	103	116	154	180	203	188	87	72	43	29
Retail	1	3	7	21	34	45	55	62	69	69	65	62	55	58	50	39	27	12	0
Fast Food Restaurant	1	2	5	7	13	20	23	23	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	20	10	8	11	8	11	11	7	6	7	12	22	21	15	8	3	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	70	140	140	140	140	140	140	140	140	140	70	47	47	16	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	705	647	725	939	1,131	1,387	1,816	1,878	2,124	1,803	1,775	1,993	2,120	2,360	2,295	2,157	2,187	2,118	1,952
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	208	259	270	275	283	288	269	361	361	352	333	315	265

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - September

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	96	144	171	180	162	162	162	90
Family Restaurant	27	59	106	165	213	213	236	201	154	94	106	142	165	186	173	80	67	40	27
Retail	1	3	6	19	32	41	51	57	64	64	60	57	51	54	47	36	25	11	0
Fast Food Restaurant	1	2	4	8	12	18	21	21	19	13	12	13	18	19	12	7	5	2	1
Spa (Health Club)	23	12	9	13	9	13	13	8	6	8	14	26	24	17	9	3	0	0	0
Hotel - Leisure	318	282	267	238	208	208	193	193	208	208	223	238	253	285	301	318	318	335	335
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	75	150	150	150	150	150	150	150	150	150	75	51	51	17	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	599	548	631	854	1,050	1,305	1,736	1,800	2,044	1,729	1,697	1,900	2,010	2,233	2,163	2,027	2,058	1,987	1,830
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	175	192	208	259	270	276	283	288	269	361	361	352	333	315	265

Shared Parking Analysis - October

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	101	152	181	190	171	171	171	95
Family Restaurant	28	62	112	174	224	224	249	212	182	100	112	150	174	197	183	84	70	42	28
Retail	1	3	7	20	33	43	52	59	66	66	62	59	52	55	48	37	26	11	0
Fast Food Restaurant	1	2	5	7	12	19	23	23	20	14	12	14	19	20	13	8	5	3	1
Spa (Health Club)	25	12	10	14	10	14	14	8	7	8	15	27	28	18	9	3	0	0	0
Hotel - Leisure	318	282	267	238	208	208	193	193	208	208	223	238	253	285	301	318	318	335	335
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	79	159	159	159	159	159	159	159	159	159	79	54	54	18	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	602	553	643	874	1,073	1,329	1,762	1,824	2,066	1,747	1,718	1,926	2,036	2,259	2,189	2,043	2,072	1,999	1,836
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	10	12	13	14	14	14	14	14	13	12	16	15	13	9	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	124	110	147	153	176	192	208	259	270	276	284	288	269	361	361	352	333	315	265

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - November

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	98	147	175	184	166	166	166	92
Family Restaurant	27	60	109	169	217	217	241	205	157	97	109	145	169	190	177	82	68	41	27
Retail	1	4	7	21	36	46	57	64	72	72	68	64	57	60	52	40	28	12	0
Fast Food Restaurant	1	2	4	7	12	19	22	22	20	13	12	13	19	20	12	7	5	2	1
Spa (Health Club)	25	12	10	14	10	14	14	8	7	8	15	27	26	18	9	3	0	0	0
Hotel - Leisure	318	282	267	238	208	208	193	193	208	208	223	238	253	285	301	318	318	335	335
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	93	187	187	187	187	187	187	187	187	187	93	63	63	21	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	601	551	654	899	1,097	1,354	1,786	1,850	2,094	1,777	1,745	1,951	2,044	2,281	2,190	2,042	2,066	1,993	1,833
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	12	13	15	15	15	15	15	15	15	13	18	16	14	10	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	125	110	148	154	177	194	209	261	272	277	285	290	271	363	363	353	334	315	265

Shared Parking Analysis - December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	106	158	188	198	178	178	178	99
Family Restaurant	29	65	117	182	234	234	260	221	169	104	117	156	182	205	190	88	73	44	29
Retail	1	5	10	30	50	65	79	89	99	99	94	89	79	84	73	56	39	17	0
Fast Food Restaurant	1	2	5	7	13	20	24	24	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	26	13	10	14	10	14	14	9	7	9	16	29	27	20	10	3	0	0	0
Hotel - Leisure	212	188	178	159	139	139	129	129	139	139	149	159	168	190	201	212	212	223	223
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	56	112	112	112	112	112	112	112	112	112	56	38	38	13	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	499	484	539	787	985	1,246	1,690	1,753	1,991	1,670	1,633	1,843	1,971	2,195	2,114	1,962	1,989	1,902	1,730
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	3	7	13	15	16	17	17	17	17	17	16	15	19	18	16	11	4	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	125	110	149	155	179	195	211	263	273	279	287	291	272	365	365	355	335	316	265

Supplemental Final EIR
Wynn Everett
Weekend Shared Parking Analysis
12/3/14 Program Change

Shared Parking Analysis - Peak December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	106	158	188	198	178	178	178	99
Family Restaurant	29	65	117	182	234	234	260	221	169	104	117	156	182	205	190	88	73	44	29
Retail	1	5	10	30	50	65	79	89	99	99	94	89	79	84	73	56	39	17	0
Fast Food Restaurant	1	2	5	7	13	20	24	24	21	14	13	14	20	21	13	8	5	3	1
Spa (Health Club)	26	13	10	14	10	14	14	9	7	9	16	29	27	20	10	3	0	0	0
Hotel - Leisure	212	188	178	159	139	139	129	129	139	139	149	159	168	190	201	212	212	223	223
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	56	112	112	112	112	112	112	112	112	112	56	38	38	13	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	499	464	539	767	985	1,246	1,690	1,753	1,991	1,670	1,633	1,843	1,971	2,195	2,114	1,962	1,989	1,902	1,730
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	3	7	13	15	16	17	17	17	17	17	18	15	19	18	16	11	4	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	125	110	149	155	179	195	211	263	273	279	287	291	272	365	365	355	335	316	265

Shared Parking Analysis - Late December

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Customer/Resident																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	0	0	100	150	179	188	170	170	170	94
Family Restaurant	28	62	111	173	222	222	247	210	160	99	111	148	173	195	181	83	69	42	28
Retail	1	4	8	16	32	48	64	76	79	79	78	68	56	54	45	27	18	9	0
Fast Food Restaurant	1	2	4	7	12	19	22	22	20	13	12	13	19	20	13	8	5	3	1
Spa (Health Club)	28	14	11	15	11	15	15	9	8	9	17	31	29	21	10	3	0	0	0
Hotel - Leisure	424	376	357	317	277	277	258	258	277	277	297	317	337	380	402	424	424	447	447
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	56	112	112	112	112	112	112	112	112	112	56	38	38	13	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	229	190	163	263	427	662	1,072	1,170	1,444	1,193	1,132	1,179	1,280	1,449	1,390	1,404	1,481	1,437	1,377
TOTAL, CUSTOMERS	711	648	710	903	1,094	1,356	1,789	1,856	2,101	1,783	1,757	1,968	2,100	2,335	2,267	2,132	2,167	2,106	1,947
Employee																			
Fine/Casual Dining	0	0	0	0	0	0	0	0	0	3	16	19	21	30	30	30	30	26	15
Family Restaurant	26	28	34	34	37	37	37	37	37	28	28	35	35	50	50	42	34	34	18
Retail	2	2	6	12	13	15	15	15	15	15	15	15	13	18	16	14	10	3	0
Fast Food Restaurant	1	1	2	2	4	5	5	5	5	4	3	4	5	7	5	3	2	2	2
Spa (Health Club)	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	0	0	0	0
Hotel - Leisure	3	14	42	42	47	47	47	47	47	47	42	35	28	36	36	36	30	30	20
Hotel Conference/Banquet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel Convention Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nightclub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casino	90	64	64	64	75	89	104	155	166	179	179	180	166	221	224	227	227	221	210
TOTAL, EMPLOYEES	125	110	148	154	177	194	209	261	272	277	285	290	271	363	363	353	334	315	265

Parking Demand Tables

Total Weekend Shared Parking Demand, Patrons

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
January	666	603	674	882	1,066	1,320	1,745	1,809	2,059	1 748	1 720	1,921	2 034	2,259	2,193	2,070	2,103	2,040	1,889
February	704	641	734	962	1,143	1,397	1,820	1,885	2,136	1 824	1 798	2,001	2 094	2,317	2,253	2,121	2,149	2,087	1,935
March	704	646	735	961	1,149	1,404	1,831	1,893	2,141	1 822	1 796	2,010	2 120	2,352	2,287	2,147	2,174	2,108	1,947
April	703	642	697	887	1,074	1,328	1,754	1,818	2,067	1 751	1 713	1,931	2 071	2,313	2,250	2,130	2,166	2,101	1,943
May	666	606	671	872	1,066	1,321	1,750	1,814	2,059	1 740	1 710	1,921	2 057	2,296	2,231	2,101	2,135	2,066	1,903
June	655	606	660	852	1,045	1,300	1,730	1,793	2,039	1 721	1 691	1,900	2 045	2,287	2,221	2,097	2,133	2,064	1,902
July	711	645	695	879	1,070	1,324	1,752	1,814	2,060	1 740	1 712	1,928	2 082	2,331	2,268	2,145	2,182	2,115	1,951
August	705	647	725	939	1,131	1,387	1,816	1,878	2,124	1 803	1 775	1,993	2 120	2,360	2,295	2,157	2,187	2,118	1,952
September	599	548	631	854	1,050	1,305	1,736	1,800	2,044	1 719	1 697	1,900	2 010	2,233	2,163	2,027	2,058	1,967	1,830
October	603	553	643	874	1,073	1,329	1,762	1,824	2,066	1 747	1 716	1,926	2 036	2,259	2,189	2,043	2,072	1,999	1,836
November	601	551	654	899	1,097	1,354	1,786	1,850	2,094	1 777	1 745	1,951	2 044	2,261	2,190	2,042	2,066	1,993	1,833
December	499	464	539	767	985	1,246	1,690	1,753	1,991	1 670	1 633	1,843	1 971	2,195	2,114	1,962	1,989	1,902	1,730
Peak December	499	464	539	767	985	1,246	1,690	1,753	1,991	1 670	1 633	1,843	1 971	2,195	2,114	1,962	1,989	1,902	1,730
Late December	711	648	710	903	1,094	1,356	1,789	1,856	2,101	1 783	1 757	1,968	2 100	2,335	2,267	2,132	2,167	2,106	1,947

Shared Parking Maximum Demand, Patrons	2,360
Parking Supply	3,400
Surplus/Deficit	1,040

Total Weekend Shared Parking Demand, Employees

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
January	121	108	146	151	174	190	206	257	268	274	281	285	266	357	357	348	329	312	264
February	121	108	146	151	174	190	206	257	268	274	281	285	266	357	357	348	329	312	264
March	124	110	147	153	176	192	208	259	270	276	284	288	269	361	361	352	333	315	265
April	124	110	147	153	175	192	208	259	270	275	283	288	269	361	361	352	333	315	265
May	124	110	147	153	175	192	207	259	270	275	283	288	269	361	362	352	331	315	265
June	124	110	147	153	175	192	207	259	270	275	281	288	269	361	361	352	333	315	265
July	124	110	147	153	175	192	207	259	270	275	283	288	269	361	361	352	333	315	265
August	124	110	147	153	175	192	208	259	270	275	283	288	269	361	361	352	333	315	265
September	124	110	147	153	175	192	208	259	270	276	283	288	269	361	361	352	333	315	265
October	124	110	147	153	176	192	208	259	270	276	284	288	269	362	361	352	333	315	265
November	125	110	148	154	177	194	209	262	272	277	285	290	271	363	363	353	334	315	265
December	125	110	149	155	179	195	211	264	273	279	287	291	272	365	365	355	335	316	265
Peak December	125	110	149	155	179	195	211	263	273	279	287	291	272	365	365	355	335	316	265
Late December	125	110	148	154	177	194	209	261	272	277	285	290	271	363	363	353	334	315	265

Maximum Demand, Employees	365

B.10 Transit Analysis

a. Orange Line Load Capacity Analysis
b. Bus Route Load Capacity Analysis
c. Bus Travel Time Analysis
    a. Scheduled Routes
    b. Pull-out/Deadhead Trips

Orange Line Load Capacity Analysis

Data for Orange Line Existing Conditions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		Future - Year 2012		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	1069	463	1069	2%	2%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	1851	3075	1851	3075	3%	2%	1.1%	1.5%	0	0	0	0	8	7.5
7 - 8 am	3452	5674	3452	5674	1%	1%	1.7%	2.1%	0	0	0	0	6	10
8 - 9 am	4759	6884	4759	6884	1%	2%	2.1%	3.5%	0	0	0	0	6	10
9 - 10 am	1927	3614	1927	3614	2%	3%	4.4%	7.6%	0	0	0	0	8	7.5
10 - 11 am	1630	2397	1630	2397	2%	4%	5.4%	7.9%	0	0	0	0	8	7.5
11 am - 12 pm	1686	1947	1686	1947	3%	5%	5.7%	7.1%	0	0	0	0	8	7.5
12 - 1 pm	1815	2065	1815	2065	3%	5%	6.4%	8.4%	0	0	0	0	8	7.5
1 - 2 pm	2048	2078	2048	2078	4%	6%	6.5%	7.3%	0	0	0	0	8	7.5
2 - 3 pm	2552	2563	2552	2563	5%	6%	9.6%	7.0%	0	0	0	0	8	7.5
3 - 4 pm	3710	2771	3710	2771	7%	6%	9.5%	6.8%	0	0	0	0	7	8.5714286
4 - 5 pm	5329	3728	5329	3728	6%	4%	0.0%	10.5%	0	0	0	0	6	10
5 - 6 pm	6393	4472	6393	4472	6%	6%	0.0%	0.0%	0	0	0	0	6	10
6 - 7 pm	3933	2124	3933	2124	6%	7%	6.7%	2.9%	0	0	0	0	8	7.5
7 - 8 pm	2437	1423	2437	1423	6%	8%	8.9%	8.6%	0	0	0	0	10	6
8 - 9 pm	2063	1233	2063	1233	6%	8%	6.2%	3.6%	0	0	0	0	10	6
9 - 10 pm	1503	936	1503	936	8%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1102	1053	1102	1053	10%	8%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	923	458	923	458	11%	6%	6.1%	3.9%	0	0	0	0	10	6
12 - 1 am	257	114	257	114	7%	3%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation		policy capacity		Peak Hours (policy capacity = 225% of # of seats):	
1.0%	per year	58	seats per car	7-9 am	AM peak
0	number of years	225%	policy capacity - peak	3:30 - 6:30 pm	PM peak
0.0%	total growth	140%	policy capacity - offpeak	6 - 7 am	Early AM
		131	Car capacity - peak	1:30 - 4 pm	Midday School
		81	Car capacity - offpeak		
		6	Cars per train		
		786	Capacity of train - peak		
		486	Capacity of train - offpeak		
		224	Crush capacity per car		

Capacity Analysis		Existing	Policy Capacity	Existing < Capacity?
	nb	463	2916	TRUE
5 - 6 am	sb	1069	2916	TRUE
	nb	1851	3645	TRUE
6 - 7 am	sb	3075	3645	TRUE
	nb	3452	7860	TRUE
7 - 8 am	sb	5674	7860	TRUE
	nb	4759	7860	TRUE
8 - 9 am	sb	6884	7860	TRUE
	nb	1927	3645	TRUE
9 - 10 am	sb	3614	3645	TRUE
	nb	1630	3645	TRUE
10 - 11 am	sb	2397	3645	TRUE
	nb	1686	3645	TRUE
11 am - 12	sb	1947	3645	TRUE
	nb	1815	3645	TRUE
12 - 1 pm	sb	2065	3645	TRUE
	nb	2048	4770	TRUE
1 - 2 pm	sb	2078	4770	TRUE
	nb	2552	5895	TRUE
2 - 3 pm	sb	2563	5895	TRUE
	nb	3710	6737.142857	TRUE
3 - 4 pm	sb	2771	6737.142857	TRUE
	nb	5329	7860	TRUE
4 - 5 pm	sb	3728	7860	TRUE
	nb	6393	7860	TRUE
5 - 6 pm	sb	4472	7860	TRUE
	nb	3933	4770	TRUE
6 - 7 pm	sb	2124	4770	TRUE
	nb	2437	2916	TRUE
7 - 8 pm	sb	1423	2916	TRUE
	nb	2063	2916	TRUE
8 - 9 pm	sb	1233	2916	TRUE
	nb	1503	2916	TRUE
9 - 10 pm	sb	936	2916	TRUE
	nb	1102	2916	TRUE
10 - 11 pm	sb	1053	2916	TRUE
	nb	923	2916	TRUE
11 pm - 12	sb	458	2916	TRUE
	nb	257	2916	TRUE
12 - 1 am	sb	114	2916	TRUE

Data for Orange Line Future Conitions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		Future - Year 2012		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at Sullivan		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at Sullivan		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	387	463	387	1%	3%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	362	783	362	783	2%	3%	1.1%	1.5%	0	0	0	0	10	6
7 - 8 am	648	1192	648	1192	2%	2%	1.6%	2.1%	0	0	0	0	10	6
8 - 9 am	1071	1271	1071	1271	2%	2%	2.0%	3.5%	0	0	0	0	10	6
9 - 10 am	989	1526	989	1526	3%	2%	4.3%	7.6%	0	0	0	0	10	6
10 - 11 am	1228	1495	1228	1495	4%	2%	5.4%	7.9%	0	0	0	0	10	6
11 am - 12 pm	1567	1614	1567	1614	5%	3%	5.7%	7.1%	0	0	0	0	10	6
12 - 1 pm	1619	1726	1619	1726	6%	3%	6.4%	8.4%	0	0	0	0	10	6
1 - 2 pm	1660	1621	1660	1621	6%	4%	6.4%	7.3%	0	0	0	0	10	6
2 - 3 pm	1747	1636	1747	1636	7%	5%	6.6%	7.0%	0	0	0	0	10	6
3 - 4 pm	1923	1819	1923	1819	7%	5%	6.5%	6.8%	0	0	0	0	9	6.6666667
4 - 5 pm	2029	1790	2029	1790	8%	6%	6.4%	6.8%	0	0	0	0	8	7.5
5 - 6 pm	1892	1925	1892	1925	6%	6%	4.9%	5.0%	0	0	0	0	8	7.5
6 - 7 pm	1565	1405	1565	1405	6%	6%	4.4%	5.8%	0	0	0	0	9	6.6666667
7 - 8 pm	1326	1187	1326	1187	7%	5%	6.6%	4.5%	0	0	0	0	10	6
8 - 9 pm	1306	981	1306	981	5%	6%	6.1%	3.6%	0	0	0	0	10	6
9 - 10 pm	1186	900	1186	900	6%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1390	847	1390	847	7%	10%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	1154	667	1154	667	8%	8%	6.0%	3.9%	0	0	0	0	10	6
12 - 1 am	532	286	532	286	4%	9%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation	
1.0%	per year
11	number of years
11.6%	total growth

policy capacity	
58	seats per car
140%	policy capacity - offpeak
81	Car capacity
6	Cars per train
486	Capacity of train - offpeak
224	Crush capacity per car

Peak Hours (policy capacity = 225% of # of seats):	
7-9 am	AM peak
3:30 - 6:30 pm	PM peak

Capacity Analysis		Existing	Policy Capacity	Existing < Capacity?
	nb	463	2916	TRUE
5 - 6 am	sb	387	2916	TRUE
	nb	362	2916	TRUE
6 - 7 am	sb	783	2916	TRUE
	nb	648	2916	TRUE
7 - 8 am	sb	1192	2916	TRUE
	nb	1071	2916	TRUE
8 - 9 am	sb	1271	2916	TRUE
	nb	989	2916	TRUE
9 - 10 am	sb	1526	2916	TRUE
	nb	1228	2916	TRUE
10 - 11 am	sb	1495	2916	TRUE
	nb	1567	2916	TRUE
11 am - 12	sb	1614	2916	TRUE
	nb	1619	2916	TRUE
12 - 1 pm	sb	1726	2916	TRUE
	nb	1660	2916	TRUE
1 - 2 pm	sb	1621	2916	TRUE
	nb	1747	2916	TRUE
2 - 3 pm	sb	1636	2916	TRUE
	nb	1923	3240	TRUE
3 - 4 pm	sb	1819	3240	TRUE
	nb	2029	3645	TRUE
4 - 5 pm	sb	1790	3645	TRUE
	nb	1892	3645	TRUE
5 - 6 pm	sb	1925	3645	TRUE
	nb	1565	3240	TRUE
6 - 7 pm	sb	1405	3240	TRUE
	nb	1326	2916	TRUE
7 - 8 pm	sb	1187	2916	TRUE
	nb	1306	2916	TRUE
8 - 9 pm	sb	981	2916	TRUE
	nb	1186	2916	TRUE
9 - 10 pm	sb	900	2916	TRUE
	nb	1390	2916	TRUE
10 - 11 pm	sb	847	2916	TRUE
	nb	1154	2916	TRUE
11 pm - 12	sb	667	2916	TRUE
	nb	532	2916	TRUE
12 - 1 am	sb	286	2916	TRUE

Data for Orange Line Existing Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		Existing - Year 2012		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	306	959	306	959	2%	2%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	1083	2495	1083	2495	3%	2%	1.1%	1.5%	0	0	0	0	8	7.5
7 - 8 am	1680	5230	1680	5230	1%	1%	1.7%	2.1%	0	0	0	0	6	10
8 - 9 am	1773	6872	1773	6872	1%	2%	2.1%	3.5%	0	0	0	0	6	10
9 - 10 am	1238	3720	1238	3720	2%	3%	4.4%	7.6%	0	0	0	0	8	7.5
10 - 11 am	1022	2092	1022	2092	2%	4%	5.4%	7.9%	0	0	0	0	8	7.5
11 am - 12 pm	1124	1801	1124	1801	3%	5%	5.7%	7.1%	0	0	0	0	8	7.5
12 - 1 pm	1283	1724	1283	1724	3%	5%	6.4%	8.4%	0	0	0	0	8	7.5
1 - 2 pm	1636	1647	1636	1647	4%	6%	6.5%	7.3%	0	0	0	0	8	7.5
2 - 3 pm	2069	1797	2069	1797	5%	6%	9.6%	7.0%	0	0	0	0	8	7.5
3 - 4 pm	3020	1901	3020	1901	7%	6%	9.5%	6.8%	0	0	0	0	7	8.5714286
4 - 5 pm	4762	1976	4762	1976	6%	4%	0.0%	10.5%	0	0	0	0	6	10
5 - 6 pm	6075	2297	6075	2297	6%	6%	0.0%	0.0%	0	0	0	0	6	10
6 - 7 pm	3727	1193	3727	1193	6%	7%	6.7%	2.9%	0	0	0	0	8	7.5
7 - 8 pm	2297	797	2297	797	6%	8%	8.9%	8.6%	0	0	0	0	10	6
8 - 9 pm	1936	814	1936	814	6%	8%	6.2%	3.6%	0	0	0	0	10	6
9 - 10 pm	1408	542	1408	542	8%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1254	401	1254	401	10%	8%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	859	183	859	183	11%	6%	6.1%	3.9%	0	0	0	0	10	6
12 - 1 am	261	68	261	68	7%	3%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

Existing -- Build trips = 0

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation

1.0% per year
0 number of years

0.0% total growth

policy capacity

58 seats per car
225% policy capacity - peak

100% policy capacity - offpeak
131 Car capacity - peak
58 Car capacity - offpeak
6 Cars per train
786 Capacity of train - peak
348 Capacity of train - offpeak

Peak Hours (policy capacity = 225% of # of seats):

6:30 - 9 am	AM peak
3:30 - 6:30 pm	PM peak
2:00 - 3:30 pm	School Peak

Capacity Analysis		Existing	Policy Capacity	Existing < Capacity?
5 - 6 am	nb	306	2088	TRUE
	sb	959	2088	TRUE
6 - 7 am	nb	1083	4253	TRUE
	sb	2495	4253	TRUE
7 - 8 am	nb	1680	7860	TRUE
	sb	5230	7860	TRUE
8 - 9 am	nb	1773	7860	TRUE
	sb	6872	7860	TRUE
9 - 10 am	nb	1238	2610	TRUE
	sb	3720	2610	FALSE
10 - 11 am	nb	1022	2610	TRUE
	sb	2092	2610	TRUE
11 am - 12	nb	1124	2610	TRUE
	sb	1801	2610	TRUE
12 - 1 pm	nb	1283	2610	TRUE
	sb	1724	2610	TRUE
1 - 2 pm	nb	1636	4253	TRUE
	sb	1647	4253	TRUE
2 - 3 pm	nb	2069	5895	TRUE
	sb	1797	5895	TRUE
3 - 4 pm	nb	3020	6737	TRUE
	sb	1901	6737	TRUE
4 - 5 pm	nb	4762	7860	TRUE
	sb	1976	7860	TRUE
5 - 6 pm	nb	6075	7860	TRUE
	sb	2297	7860	TRUE
6 - 7 pm	nb	3727	4253	TRUE
	sb	1193	4253	TRUE
7 - 8 pm	nb	2297	2088	FALSE
	sb	797	2088	TRUE
8 - 9 pm	nb	1936	2088	TRUE
	sb	814	2088	TRUE
9 - 10 pm	nb	1408	2088	TRUE
	sb	542	2088	TRUE
10 - 11 pm	nb	1254	2088	TRUE
	sb	401	2088	TRUE
11 pm - 12	nb	859	2088	TRUE
	sb	183	2088	TRUE
12 - 1 am	nb	261	2088	TRUE
	sb	68	2088	TRUE

Data for Orange Line Existing Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		Existing - Year 2012		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	145	253	145	253	1%	3%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	245	615	245	615	2%	3%	1.1%	1.5%	0	0	0	0	10	6
7 - 8 am	407	900	407	900	2%	2%	1.6%	2.1%	0	0	0	0	10	6
8 - 9 am	873	1039	873	1039	2%	2%	2.0%	3.5%	0	0	0	0	10	6
9 - 10 am	526	1563	526	1563	3%	2%	4.3%	7.6%	0	0	0	0	10	6
10 - 11 am	657	1379	657	1379	4%	2%	5.4%	7.9%	0	0	0	0	10	6
11 am - 12 pm	801	1729	801	1729	5%	3%	5.7%	7.1%	0	0	0	0	10	6
12 - 1 pm	865	1758	865	1758	6%	3%	6.4%	8.4%	0	0	0	0	10	6
1 - 2 pm	849	1466	849	1466	6%	4%	6.4%	7.3%	0	0	0	0	10	6
2 - 3 pm	1063	1416	1063	1416	7%	5%	6.6%	7.0%	0	0	0	0	10	6
3 - 4 pm	1336	1415	1336	1415	7%	5%	6.5%	6.8%	0	0	0	0	9	6.6666667
4 - 5 pm	1545	1306	1545	1306	8%	6%	6.4%	6.8%	0	0	0	0	8	7.5
5 - 6 pm	1669	1088	1669	1088	6%	6%	4.9%	5.0%	0	0	0	0	8	7.5
6 - 7 pm	1451	853	1451	853	6%	6%	4.4%	5.8%	0	0	0	0	9	6.6666667
7 - 8 pm	1279	785	1279	785	7%	5%	6.6%	4.5%	0	0	0	0	10	6
8 - 9 pm	1122	601	1122	601	5%	6%	6.1%	3.6%	0	0	0	0	10	6
9 - 10 pm	1122	480	1122	480	6%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1209	496	1209	496	7%	10%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	1111	316	1111	316	8%	8%	6.0%	3.9%	0	0	0	0	10	6
12 - 1 am	539	130	539	130	4%	9%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period

Existing -- 8uild trips = 0

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	8ack 8ay	80%	Back 8ay	80%

growth calculation		policy capacity		Peak Hours (policy capacity = 225% of # of seats):	
1.0%	per year	58	seats per car	6:30 - 9 am	AM peak
0	number of years	100%	policy capacity - offpeak	3:30 - 6:30 pm	PM peak
		58	Car capacity		
0.0%	total growth	6	Cars per train	6 - 7 am	Early AM
		348	Capacity of train - offpeak	1:30 - 4 pm	Midday School
		224	Crush capacity per car		

Capacity Analysis		Existing	Policy Capacity	Existing < Capacity?
	nb	145	2088	TRUE
5 - 6 am	sb	253	2088	TRUE
	nb	245	2088	TRUE
6 - 7 am	sb	615	2088	TRUE
	nb	407	2088	TRUE
7 - 8 am	sb	900	2088	TRUE
	nb	873	2088	TRUE
8 - 9 am	sb	1039	2088	TRUE
	nb	526	2088	TRUE
9 - 10 am	sb	1563	2088	TRUE
	nb	657	2088	TRUE
10 - 11 am	sb	1379	2088	TRUE
	nb	801	2088	TRUE
11 am - 12	sb	1729	2088	TRUE
	nb	865	2088	TRUE
12 - 1 pm	sb	1758	2088	TRUE
	nb	849	2088	TRUE
1 - 2 pm	sb	1466	2088	TRUE
	nb	1063	2088	TRUE
2 - 3 pm	sb	1416	2088	TRUE
	nb	1336	2320	TRUE
3 - 4 pm	sb	1415	2320	TRUE
	nb	1545	2610	TRUE
4 - 5 pm	sb	1306	2610	TRUE
	nb	1669	2610	TRUE
5 - 6 pm	sb	1088	2610	TRUE
	nb	1451	2320	TRUE
6 - 7 pm	sb	853	2320	TRUE
	nb	1279	2088	TRUE
7 - 8 pm	sb	785	2088	TRUE
	nb	1122	2088	TRUE
8 - 9 pm	sb	601	2088	TRUE
	nb	1122	2088	TRUE
9 - 10 pm	sb	480	2088	TRUE
	nb	1209	2088	TRUE
10 - 11 pm	sb	496	2088	TRUE
	nb	1111	2088	TRUE
11 pm - 12	sb	316	2088	TRUE
	nb	539	2088	TRUE
12 - 1 am	sb	130	2088	TRUE

Data for Orange Line No Build Conditions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	1069	517	1193	2%	2%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	1851	3075	2065	3431	3%	2%	1.1%	1.5%	0	0	0	0	7.5	8
7 - 8 am	3452	5674	3851	6330	1%	1%	1.7%	2.1%	0	0	0	0	5	12
8 - 9 am	4759	6884	5309	7680	1%	2%	2.1%	3.5%	0	0	0	0	5	12
9 - 10 am	1927	3614	2150	4032	2%	3%	4.4%	7.6%	0	0	0	0	8	7.5
10 - 11 am	1630	2397	1819	2674	2%	4%	5.4%	7.9%	0	0	0	0	8	7.5
11 am - 12 pm	1686	1947	1881	2172	3%	5%	5.7%	7.1%	0	0	0	0	8	7.5
12 - 1 pm	1815	2065	2025	2304	3%	5%	6.4%	8.4%	0	0	0	0	8	7.5
1 - 2 pm	2048	2078	2285	2318	4%	6%	6.5%	7.3%	0	0	0	0	8	7.5
2 - 3 pm	2552	2563	2847	2859	5%	6%	9.6%	7.0%	0	0	0	0	8	7.5
3 - 4 pm	3710	2771	4139	3092	7%	6%	9.5%	6.8%	0	0	0	0	6.5	9.2307692
4 - 5 pm	5329	3728	5945	4159	6%	4%	0.0%	10.5%	0	0	0	0	5	12
5 - 6 pm	6393	4472	7132	4989	6%	6%	0.0%	0.0%	0	0	0	0	5	12
6 - 7 pm	3933	2124	4388	2370	6%	7%	6.7%	2.9%	0	0	0	0	7.5	8
7 - 8 pm	2437	1423	2719	1588	6%	8%	8.9%	8.6%	0	0	0	0	10	6
8 - 9 pm	2063	1233	2302	1376	6%	8%	6.2%	3.6%	0	0	0	0	10	6
9 - 10 pm	1503	936	1677	1044	8%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1102	1053	1229	1175	10%	8%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	923	458	1030	511	11%	6%	6.1%	3.9%	0	0	0	0	10	6
12 - 1 am	257	114	287	127	7%	3%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation		policy capacity		Peak Hours (policy capacity = 225% of # of seats):	
1.0%	per year	58	seats per car	6:30-9:00 am	AM peak
11	number of years	225%	policy capacity - peak	3:30 - 6:30 pm	PM peak
11.6%	total growth	140%	policy capacity - offpeak	6 - 7 am	Early AM
		131	Car capacity - peak	1:30 - 4 pm	Midday School
		81	Car capacity - offpeak		
		6	Cars per train		
		786	Capacity of train - peak		
		486	Capacity of train - offpeak		
		224	Crush capacity per car		

Capacity Analysis		No-Build	Wynn	Policy Capacity	No Build < Capacity?
	nb	517	0	2916	TRUE
5 - 6 am	sb	1193	0	2916	TRUE
	nb	2065	0	3888	TRUE
6 - 7 am	sb	3431	0	3888	TRUE
	nb	3851	0	9432	TRUE
7 - 8 am	sb	6330	0	9432	TRUE
	nb	5309	0	9432	TRUE
8 - 9 am	sb	7680	0	9432	TRUE
	nb	2150	0	3645	TRUE
9 - 10 am	sb	4032	0	3645	FALSE
	nb	1819	0	3645	TRUE
10 - 11 am	sb	2674	0	3645	TRUE
	nb	1881	0	3645	TRUE
11 am - 12	sb	2172	0	3645	TRUE
	nb	2025	0	3645	TRUE
12 - 1 pm	sb	2304	0	3645	TRUE
	nb	2285	0	4770	TRUE
1 - 2 pm	sb	2318	0	4770	TRUE
	nb	2847	0	5895	TRUE
2 - 3 pm	sb	2859	0	5895	TRUE
	nb	4139	0	7255.384615	TRUE
3 - 4 pm	sb	3092	0	7255.384615	TRUE
	nb	5945	0	9432	TRUE
4 - 5 pm	sb	4159	0	9432	TRUE
	nb	7132	0	9432	TRUE
5 - 6 pm	sb	4989	0	9432	TRUE
	nb	4388	0	5088	TRUE
6 - 7 pm	sb	2370	0	5088	TRUE
	nb	2719	0	2916	TRUE
7 - 8 pm	sb	1588	0	2916	TRUE
	nb	2302	0	2916	TRUE
8 - 9 pm	sb	1376	0	2916	TRUE
	nb	1677	0	2916	TRUE
9 - 10 pm	sb	1044	0	2916	TRUE
	nb	1229	0	2916	TRUE
10 - 11 pm	sb	1175	0	2916	TRUE
	nb	1030	0	2916	TRUE
11 pm - 12	sb	511	0	2916	TRUE
	nb	287	0	2916	TRUE
12 - 1 am	sb	127	0	2916	TRUE

Data for Orange Line No Build Conditions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at Sullivan		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at Sullivan		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	387	517	432	1%	3%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	362	783	404	874	2%	3%	1.1%	1.5%	0	0	0	0	10	6
7 - 8 am	648	1192	723	1330	2%	2%	1.6%	2.1%	0	0	0	0	10	6
8 - 9 am	1071	1271	1195	1418	2%	2%	2.0%	3.5%	0	0	0	0	10	6
9 - 10 am	989	1526	1103	1703	3%	2%	4.3%	7.6%	0	0	0	0	10	6
10 - 11 am	1228	1495	1370	1668	4%	2%	5.4%	7.9%	0	0	0	0	10	6
11 am - 12 pm	1567	1614	1748	1801	5%	3%	5.7%	7.1%	0	0	0	0	10	6
12 - 1 pm	1619	1726	1806	1926	6%	3%	6.4%	8.4%	0	0	0	0	10	6
1 - 2 pm	1660	1621	1852	1808	6%	4%	6.4%	7.3%	0	0	0	0	10	6
2 - 3 pm	1747	1636	1949	1825	7%	5%	6.6%	7.0%	0	0	0	0	10	6
3 - 4 pm	1923	1819	2145	2029	7%	5%	6.5%	6.8%	0	0	0	0	9	6.6666667
4 - 5 pm	2029	1790	2264	1997	8%	6%	6.4%	6.8%	0	0	0	0	8	7.5
5 - 6 pm	1892	1925	2111	2148	6%	6%	4.9%	5.0%	0	0	0	0	8	7.5
6 - 7 pm	1565	1405	1746	1568	6%	6%	4.4%	5.8%	0	0	0	0	9	6.6666667
7 - 8 pm	1326	1187	1479	1324	7%	5%	6.6%	4.5%	0	0	0	0	10	6
8 - 9 pm	1306	981	1457	1094	5%	6%	6.1%	3.6%	0	0	0	0	10	6
9 - 10 pm	1186	900	1323	1004	6%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1390	847	1551	945	7%	10%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	1154	667	1287	744	8%	8%	6.0%	3.9%	0	0	0	0	10	6
12 - 1 am	532	286	594	319	4%	9%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period
Assumed

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation		policy capacity	
1.0%	per year	58	seats per car
11	number of years	140%	policy capacity - offpeak
		81	Car capacity
11.6%	total growth	6	Cars per train
		486	Capacity of train - offpeak
		224	Crush capacity per car

Peak Hours (policy capacity = 225% of # of seats):

6:30-9:00 am	AM peak
3:30 - 6:30 pm	PM peak

Capacity Analysis		No-Build	Policy Capacity	No Build < Capacity?
5 - 6 am	nb	517	2916	TRUE
	sb	432	2916	TRUE
6 - 7 am	nb	404	2916	TRUE
	sb	874	2916	TRUE
7 - 8 am	nb	723	2916	TRUE
	sb	1330	2916	TRUE
8 - 9 am	nb	1195	2916	TRUE
	sb	1418	2916	TRUE
9 - 10 am	nb	1103	2916	TRUE
	sb	1703	2916	TRUE
10 - 11 am	nb	1370	2916	TRUE
	sb	1668	2916	TRUE
11 am - 12	nb	1748	2916	TRUE
	sb	1801	2916	TRUE
12 - 1 pm	nb	1806	2916	TRUE
	sb	1926	2916	TRUE
1 - 2 pm	nb	1852	2916	TRUE
	sb	1808	2916	TRUE
2 - 3 pm	nb	1949	2916	TRUE
	sb	1825	2916	TRUE
3 - 4 pm	nb	2145	3240	TRUE
	sb	2029	3240	TRUE
4 - 5 pm	nb	2264	3645	TRUE
	sb	1997	3645	TRUE
5 - 6 pm	nb	2111	3645	TRUE
	sb	2148	3645	TRUE
6 - 7 pm	nb	1746	3240	TRUE
	sb	1568	3240	TRUE
7 - 8 pm	nb	1479	2916	TRUE
	sb	1324	2916	TRUE
8 - 9 pm	nb	1457	2916	TRUE
	sb	1094	2916	TRUE
9 - 10 pm	nb	1323	2916	TRUE
	sb	1004	2916	TRUE
10 - 11 pm	nb	1551	2916	TRUE
	sb	945	2916	TRUE
11 pm - 12	nb	1287	2916	TRUE
	sb	744	2916	TRUE
12 - 1 am	nb	594	2916	TRUE
	sb	319	2916	TRUE

Data for Orange Line No Build Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	306	959	341	1070	2%	2%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	1083	2495	1208	2784	3%	2%	1.1%	1.5%	0	0	0	0	7.5	8
7 - 8 am	1680	5230	1874	5835	1%	1%	1.7%	2.1%	0	0	0	0	5	12
8 - 9 am	1773	6872	1978	7667	1%	2%	2.1%	3.5%	0	0	0	0	5	12
9 - 10 am	1238	3720	1381	4150	2%	3%	4.4%	7.6%	0	0	0	0	8	7.5
10 - 11 am	1022	2092	1140	2334	2%	4%	5.4%	7.9%	0	0	0	0	8	7.5
11 am - 12 pm	1124	1801	1254	2009	3%	5%	5.7%	7.1%	0	0	0	0	8	7.5
12 - 1 pm	1283	1724	1431	1923	3%	5%	6.4%	8.4%	0	0	0	0	8	7.5
1 - 2 pm	1636	1647	1825	1838	4%	6%	6.5%	7.3%	0	0	0	0	8	7.5
2 - 3 pm	2069	1797	2308	2005	5%	6%	9.6%	7.0%	0	0	0	0	8	7.5
3 - 4 pm	3020	1901	3369	2121	7%	6%	9.5%	6.8%	0	0	0	0	6.5	9.2307692
4 - 5 pm	4762	1976	5313	2205	6%	4%	0.0%	10.5%	0	0	0	0	5	12
5 - 6 pm	6075	2297	6778	2563	6%	6%	0.0%	0.0%	0	0	0	0	5	12
6 - 7 pm	3727	1193	4158	1331	6%	7%	6.7%	2.9%	0	0	0	0	7.5	8
7 - 8 pm	2297	797	2563	889	6%	8%	8.9%	8.6%	0	0	0	0	10	6
8 - 9 pm	1936	814	2160	908	6%	8%	6.2%	3.6%	0	0	0	0	10	6
9 - 10 pm	1408	542	1571	605	8%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1254	401	1399	447	10%	8%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	859	183	958	204	11%	6%	6.1%	3.9%	0	0	0	0	10	6
12 - 1 am	261	68	291	76	7%	3%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation

1.0% per year
11 number of years

11.6% total growth

policy capacity

58 seats per car
225% policy capacity - peak

100% policy capacity - offpeak
131 Car capacity - peak
58 Car capacity - offpeak
6 Cars per train
786 Capacity of train - peak
348 Capacity of train - offpeak

Peak Hours (policy capacity = 225% of # of seats):

6:30 - 9 am AM peak
3:30 - 6:30 pm PM peak

6 - 7 am Early AM
1:30 - 4 pm Midday School

Capacity Analysis		No-Build	Policy Capacity	No Build < Capacity?
	nb	341	2088	TRUE
5 - 6 am	sb	1070	2088	TRUE
	nb	1208	4536	TRUE
6 - 7 am	sb	2784	4536	TRUE
	nb	1874	9432	TRUE
7 - 8 am	sb	5835	9432	TRUE
	nb	1978	9432	TRUE
8 - 9 am	sb	7667	9432	TRUE
	nb	1381	2610	TRUE
9 - 10 am	sb	4150	2610	FALSE
	nb	1140	2610	TRUE
10 - 11 am	sb	2334	2610	TRUE
	nb	1254	2610	TRUE
11 am - 12	sb	2009	2610	TRUE
	nb	1431	2610	TRUE
12 - 1 pm	sb	1923	2610	TRUE
	nb	1825	4253	TRUE
1 - 2 pm	sb	1838	4253	TRUE
	nb	2308	5895	TRUE
2 - 3 pm	sb	2005	5895	TRUE
	nb	3369	7255	TRUE
3 - 4 pm	sb	2121	7255	TRUE
	nb	5313	9432	TRUE
4 - 5 pm	sb	2205	9432	TRUE
	nb	6778	9432	TRUE
5 - 6 pm	sb	2563	9432	TRUE
	nb	4158	4536	TRUE
6 - 7 pm	sb	1331	4536	TRUE
	nb	2563	2088	FALSE
7 - 8 pm	sb	889	2088	TRUE
	nb	2160	2088	FALSE
8 - 9 pm	sb	908	2088	TRUE
	nb	1571	2088	TRUE
9 - 10 pm	sb	605	2088	TRUE
	nb	1399	2088	TRUE
10 - 11 pm	sb	447	2088	TRUE
	nb	958	2088	TRUE
11 pm - 12	sb	204	2088	TRUE
	nb	291	2088	TRUE
12 - 1 am	sb	76	2088	TRUE

Data for Orange Line No Build Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	145	253	162	282	1%	3%	1.1%	0.3%	0	0	0	0	10	6
6 - 7 am	245	615	273	686	2%	3%	1.1%	1.5%	0	0	0	0	9	6.6666667
7 - 8 am	407	900	454	1004	2%	2%	1.6%	2.1%	0	0	0	0	8	7.5
8 - 9 am	873	1039	974	1159	2%	2%	2.0%	3.5%	0	0	0	0	8	7.5
9 - 10 am	526	1563	587	1744	3%	2%	4.3%	7.6%	0	0	0	0	8	7.5
10 - 11 am	657	1379	733	1539	4%	2%	5.4%	7.9%	0	0	0	0	8	7.5
11 am - 12 pm	801	1729	894	1929	5%	3%	5.7%	7.1%	0	0	0	0	8	7.5
12 - 1 pm	865	1758	965	1961	6%	3%	6.4%	8.4%	0	0	0	0	8	7.5
1 - 2 pm	849	1466	947	1636	6%	4%	6.4%	7.3%	0	0	0	0	8	7.5
2 - 3 pm	1063	1416	1186	1580	7%	5%	6.6%	7.0%	0	0	0	0	8	7.5
3 - 4 pm	1336	1415	1491	1579	7%	5%	6.5%	6.8%	0	0	0	0	8	7.5
4 - 5 pm	1545	1306	1724	1457	8%	6%	6.4%	6.8%	0	0	0	0	8	7.5
5 - 6 pm	1669	1088	1862	1214	6%	6%	4.9%	5.0%	0	0	0	0	8	7.5
6 - 7 pm	1451	853	1619	952	6%	6%	4.4%	5.8%	0	0	0	0	9	6.6666667
7 - 8 pm	1279	785	1427	876	7%	5%	6.6%	4.5%	0	0	0	0	10	6
8 - 9 pm	1122	601	1252	671	5%	6%	6.1%	3.6%	0	0	0	0	10	6
9 - 10 pm	1122	480	1252	536	6%	8%	7.4%	3.8%	0	0	0	0	10	6
10 - 11 pm	1209	496	1349	553	7%	10%	6.7%	4.1%	0	0	0	0	10	6
11 pm - 12 am	1111	316	1240	353	8%	8%	6.0%	3.9%	0	0	0	0	10	6
12 - 1 am	539	130	601	145	4%	9%	4.5%	3.1%	0	0	0	0	10	6

Accounts for 1/2 hour start of peak perioc

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	0	in	0	Oak Grove	20%	Oak Grove	20%
out	0	out	0	Back Bay	80%	Back Bay	80%

growth calculation
1.0% per year
11 number of years

11.6% total growth

policy capacity
58 seats per car
100% policy capacity - offpeak
58 Car capacity
6 Cars per train
348 Capacity of train - offpeak
224 Crush capacity per car

Peak Hours (policy capacity = 225% of # of seats):
6:30 - 9 am AM peak
3:30 - 6:30 pm PM peak

Capacity Analysis		No-Build	Policy Capacity	No Build < Capacity?
	nb	162	2088	TRUE
5 - 6 am	sb	282	2088	TRUE
	nb	273	2320	TRUE
6 - 7 am	sb	686	2320	TRUE
	nb	454	2610	TRUE
7 - 8 am	sb	1004	2610	TRUE
	nb	974	2610	TRUE
8 - 9 am	sb	1159	2610	TRUE
	nb	587	2610	TRUE
9 - 10 am	sb	1744	2610	TRUE
	nb	733	2610	TRUE
10 - 11 am	sb	1539	2610	TRUE
	nb	894	2610	TRUE
11 am - 12	sb	1929	2610	TRUE
	nb	965	2610	TRUE
12 - 1 pm	sb	1961	2610	TRUE
	nb	947	2610	TRUE
1 - 2 pm	sb	1636	2610	TRUE
	nb	1186	2610	TRUE
2 - 3 pm	sb	1580	2610	TRUE
	nb	1491	2610	TRUE
3 - 4 pm	sb	1579	2610	TRUE
	nb	1724	2610	TRUE
4 - 5 pm	sb	1457	2610	TRUE
	nb	1862	2610	TRUE
5 - 6 pm	sb	1214	2610	TRUE
	nb	1619	2320	TRUE
6 - 7 pm	sb	952	2320	TRUE
	nb	1427	2088	TRUE
7 - 8 pm	sb	876	2088	TRUE
	nb	1252	2088	TRUE
8 - 9 pm	sb	671	2088	TRUE
	nb	1252	2088	TRUE
9 - 10 pm	sb	536	2088	TRUE
	nb	1349	2088	TRUE
10 - 11 pm	sb	553	2088	TRUE
	nb	1240	2088	TRUE
11 pm - 12	sb	353	2088	TRUE
	nb	601	2088	TRUE
12 - 1 am	sb	145	2088	TRUE

Data for Orange Line Build Conditions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
28-Jan-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	1069	517	1193	2%	2%	1.1%	0.3%	46	33	6	1	10	6
6 - 7 am	1851	3075	2065	3431	3%	2%	1.1%	1.5%	49	30	6	8	7.5	8
7 - 8 am	3452	5674	3851	6330	1%	1%	1.7%	2.1%	27	28	9	11	5	12
8 - 9 am	4759	6884	5309	7680	1%	2%	2.1%	3.5%	18	30	11	19	5	12
9 - 10 am	1927	3614	2150	4032	2%	3%	4.4%	7.6%	31	63	23	41	8	7.5
10 - 11 am	1630	2397	1819	2674	2%	4%	5.4%	7.9%	38	81	29	42	8	7.5
11 am - 12 pm	1686	1947	1881	2172	3%	5%	5.7%	7.1%	53	87	31	38	8	7.5
12 - 1 pm	1815	2065	2025	2304	3%	5%	6.4%	8.4%	62	91	35	45	8	7.5
1 - 2 pm	2048	2078	2285	2318	4%	6%	6.5%	7.3%	77	110	35	39	8	7.5
2 - 3 pm	2552	2563	2847	2859	5%	6%	9.6%	7.0%	88	120	51	38	8	7.5
3 - 4 pm	3710	2771	4139	3092	7%	6%	9.5%	6.8%	122	104	51	37	6.5	9.2307692
4 - 5 pm	5329	3728	5945	4159	6%	4%	0.0%	10.5%	111	81	0	56	5	12
5 - 6 pm	6393	4472	7132	4989	6%	6%	0.0%	0.0%	108	102	0	0	5	12
6 - 7 pm	3933	2124	4388	2370	6%	7%	6.7%	2.9%	106	128	36	16	7.5	8
7 - 8 pm	2437	1423	2719	1588	6%	8%	8.9%	8.6%	119	152	48	46	10	6
8 - 9 pm	2063	1233	2302	1376	6%	8%	6.2%	3.6%	119	152	33	19	10	6
9 - 10 pm	1503	936	1677	1044	8%	8%	7.4%	3.8%	157	148	40	21	10	6
10 - 11 pm	1102	1053	1229	1175	10%	8%	6.7%	4.1%	181	148	36	22	10	6
11 pm - 12 am	923	458	1030	511	11%	6%	6.1%	3.9%	201	112	33	21	10	6
12 - 1 am	257	114	287	127	7%	3%	4.5%	3.1%	139	57	24	17	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

NOTE: ALL HEADWAYS ABOVE ARE EXISTING; NO CHANGES MADE TO ACCOUNT FOR NEW TRAIN SETS IN OFF-PEAK PERIODS

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %
in	2323	in	673	Oak Grove	20%	Oak Grove	20%
out	2323	out	673	Back Bay	80%	Back Bay	80%

growth calculation

1.0% per year
11 number of years

11.6% total growth

policy capacity

58 seats per car
225% policy capacity - peak

140% policy capacity - offpeak
131 Car capacity - peak
81 Car capacity - offpeak
6 Cars per train
786 Capacity of train - peak
486 Capacity of train - offpeak
224 Crush capacity per car

Peak Hours (policy capacity = 225% of # of seats):

6:30- 9:00 am	AM peak
3:30 - 6:30 pm	PM peak
6 - 7 am	Early AM
1:30 - 4 pm	Midday School

Capacity Analysis		No-Build	Wynn	Build	Policy Capacity	No Build < Capacity?	Build < Capacity?
	nb	517	53	569	2,916	TRUE	TRUE
5 - 6 am	sb	1193	35	1228	2,916	TRUE	TRUE
	nb	2065	55	2120	3,888	TRUE	TRUE
6 - 7 am	sb	3431	38	3468	3,888	TRUE	TRUE
	nb	3851	36	3887	9,432	TRUE	TRUE
7 - 8 am	sb	6330	39	6369	9,432	TRUE	TRUE
	nb	5309	29	5338	9,432	TRUE	TRUE
8 - 9 am	sb	7680	48	7729	9,432	TRUE	TRUE
	nb	2150	54	2204	3,645	TRUE	TRUE
9 - 10 am	sb	4032	104	4136	3,645	FALSE	FALSE
	nb	1819	67	1885	3,645	TRUE	TRUE
10 - 11 am	sb	2674	123	2797	3,645	TRUE	TRUE
	nb	1881	84	1965	3,645	TRUE	TRUE
11 am - 12	sb	2172	125	2297	3,645	TRUE	TRUE
	nb	2025	97	2121	3,645	TRUE	TRUE
12 - 1 pm	sb	2304	136	2439	3,645	TRUE	TRUE
	nb	2285	112	2397	4,770	TRUE	TRUE
1 - 2 pm	sb	2318	150	2468	4,770	TRUE	TRUE
	nb	2847	140	2987	5,895	TRUE	TRUE
2 - 3 pm	sb	2859	158	3018	5,895	TRUE	TRUE
	nb	4139	173	4312	7,255	TRUE	TRUE
3 - 4 pm	sb	3092	141	3233	7,255	TRUE	TRUE
	nb	5945	111	6056	9,432	TRUE	TRUE
4 - 5 pm	sb	4159	137	4296	9,432	TRUE	TRUE
	nb	7132	108	7241	9,432	TRUE	TRUE
5 - 6 pm	sb	4989	102	5092	9,432	TRUE	TRUE
	nb	4388	142	4530	5,088	TRUE	TRUE
6 - 7 pm	sb	2370	144	2513	5,088	TRUE	TRUE
	nb	2719	167	2886	2,916	TRUE	TRUE
7 - 8 pm	sb	1588	198	1786	2,916	TRUE	TRUE
	nb	2302	153	2454	2,916	TRUE	TRUE
8 - 9 pm	sb	1376	171	1547	2,916	TRUE	TRUE
	nb	1677	197	1874	2,916	TRUE	TRUE
9 - 10 pm	sb	1044	168	1213	2,916	TRUE	TRUE
	nb	1229	218	1447	2,916	TRUE	TRUE
10 - 11 pm	sb	1175	170	1345	2,916	TRUE	TRUE
	nb	1030	234	1264	2,916	TRUE	TRUE
11 pm - 12	sb	511	133	644	2,916	TRUE	TRUE
	nb	287	164	450	2,916	TRUE	TRUE
12 - 1 am	sb	127	74	201	2,916	TRUE	TRUE

Data for Orange Line Build Conditions Weekday Ridership Graph
State to Downtown Crossing
Calculated by Howard/Stein-Hudson Associates
28-Jan-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at Sullivan		Patrons Wynn Project Trips (using Orange Line at Sullivan		Employees Wynn Project Trips (using Orange Line at		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	463	387	517	432	1%	3%	1.1%	0.3%	29	60	7	2	10	6
6 - 7 am	362	783	404	874	2%	3%	1.1%	1.5%	34	62	7	10	10	6
7 - 8 am	648	1192	723	1330	2%	2%	1.6%	2.1%	34	54	10	14	10	6
8 - 9 am	1071	1271	1195	1418	2%	2%	2.0%	3.5%	42	43	13	23	10	6
9 - 10 am	989	1526	1103	1703	3%	2%	4.3%	7.6%	68	49	28	50	10	6
10 - 11 am	1228	1495	1370	1668	4%	2%	5.4%	7.9%	84	50	35	51	10	6
11 am - 12 pm	1567	1614	1748	1801	5%	3%	5.7%	7.1%	102	67	37	46	10	6
12 - 1 pm	1619	1726	1806	1926	6%	3%	6.4%	8.4%	123	77	41	54	10	6
1 - 2 pm	1660	1621	1852	1808	6%	4%	6.4%	7.3%	143	95	42	47	10	6
2 - 3 pm	1747	1636	1949	1825	7%	5%	6.6%	7.0%	161	115	43	46	10	6
3 - 4 pm	1923	1819	2145	2029	7%	5%	6.5%	6.8%	145	107	42	44	9	6.6666667
4 - 5 pm	2029	1790	2264	1997	8%	6%	6.4%	6.8%	170	133	42	44	8	7.5
5 - 6 pm	1892	1925	2111	2148	6%	6%	4.9%	5.0%	133	133	32	33	8	7.5
6 - 7 pm	1565	1405	1746	1568	6%	6%	4.4%	5.8%	124	138	29	38	9	6.6666667
7 - 8 pm	1326	1187	1479	1324	7%	5%	6.6%	4.5%	156	119	43	29	10	6
8 - 9 pm	1306	981	1457	1094	5%	6%	6.1%	3.6%	105	125	40	23	10	6
9 - 10 pm	1186	900	1323	1004	6%	8%	7.4%	3.8%	125	169	48	25	10	6
10 - 11 pm	1390	847	1551	945	7%	10%	6.7%	4.1%	149	223	43	27	10	6
11 pm - 12 am	1154	667	1287	744	8%	8%	6.0%	3.9%	187	180	39	25	10	6
12 - 1 am	532	286	594	319	4%	9%	4.5%	3.1%	95	209	29	20	10	6

Accounts for 1/2 hour start of peak period
Assumed

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %
in	2760	in	814	Oak Grove	20%	Oak Grove	20%
out	2760	out	814	Back Bay	80%	Back Bay	80%

growth calculation
1.0% per year
11 number of years
11.6% total growth

policy capacity
58 seats per car
140% policy capacity - offpeak
81 Car capacity
6 Cars per train
486 Capacity of train - offpeak
224 Crush capacity per car

Peak Hours (policy capacity = 225% of # of seats):
6:30- 9:00 am AM peak
3:30 - 6:30 pm PM peak

Capacity Analysis		No-Build	Wynn	Build	Policy Capacity	No Build < Capacity?	Build < Capacity?
5 - 6 am	nb	517	36	552	2916	TRUE	TRUE
	sb	432	62	493	2916	TRUE	TRUE
6 - 7 am	nb	404	41	445	2916	TRUE	TRUE
	sb	874	71	945	2916	TRUE	TRUE
7 - 8 am	nb	723	44	767	2916	TRUE	TRUE
	sb	1330	68	1398	2916	TRUE	TRUE
8 - 9 am	nb	1195	55	1250	2916	TRUE	TRUE
	sb	1418	66	1484	2916	TRUE	TRUE
9 - 10 am	nb	1103	96	1199	2916	TRUE	TRUE
	sb	1703	99	1801	2916	TRUE	TRUE
10 - 11 am	nb	1370	119	1489	2916	TRUE	TRUE
	sb	1668	101	1769	2916	TRUE	TRUE
11 am - 12	nb	1748	139	1887	2916	TRUE	TRUE
	sb	1801	113	1914	2916	TRUE	TRUE
12 - 1 pm	nb	1806	164	1971	2916	TRUE	TRUE
	sb	1926	131	2057	2916	TRUE	TRUE
1 - 2 pm	nb	1852	184	2036	2916	TRUE	TRUE
	sb	1808	143	1951	2916	TRUE	TRUE
2 - 3 pm	nb	1949	204	2153	2916	TRUE	TRUE
	sb	1825	160	1986	2916	TRUE	TRUE
3 - 4 pm	nb	2145	187	2333	3240	TRUE	TRUE
	sb	2029	151	2181	3240	TRUE	TRUE
4 - 5 pm	nb	2264	211	2475	3645	TRUE	TRUE
	sb	1997	178	2175	3645	TRUE	TRUE
5 - 6 pm	nb	2111	165	2276	3645	TRUE	TRUE
	sb	2148	166	2314	3645	TRUE	TRUE
6 - 7 pm	nb	1746	153	1899	3240	TRUE	TRUE
	sb	1568	176	1744	3240	TRUE	TRUE
7 - 8 pm	nb	1479	199	1678	2916	TRUE	TRUE
	sb	1324	148	1472	2916	TRUE	TRUE
8 - 9 pm	nb	1457	145	1602	2916	TRUE	TRUE
	sb	1094	148	1243	2916	TRUE	TRUE
9 - 10 pm	nb	1323	173	1496	2916	TRUE	TRUE
	sb	1004	193	1197	2916	TRUE	TRUE
10 - 11 pm	nb	1551	193	1744	2916	TRUE	TRUE
	sb	945	250	1195	2916	TRUE	TRUE
11 pm - 12	nb	1287	226	1514	2916	TRUE	TRUE
	sb	744	205	949	2916	TRUE	TRUE
12 - 1 am	nb	594	124	717	2916	TRUE	TRUE
	sb	319	229	548	2916	TRUE	TRUE

Data for Orange Line Build Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	306	959	341	1070	2%	2%	1.1%	0.3%	46	33	6	1	10	6
6 - 7 am	1083	2495	1208	2784	3%	2%	1.1%	1.5%	49	30	6	8	7.5	8
7 - 8 am	1680	5230	1874	5835	1%	1%	1.7%	2.1%	27	28	9	11	5	12
8 - 9 am	1773	6872	1978	7667	1%	2%	2.1%	3.5%	18	30	11	19	5	12
9 - 10 am	1238	3720	1381	4150	2%	3%	4.4%	7.6%	31	63	23	41	8	7.5
10 - 11 am	1022	2092	1140	2334	2%	4%	5.4%	7.9%	38	81	29	42	8	7.5
11 am - 12 pm	1124	1801	1254	2009	3%	5%	5.7%	7.1%	53	87	31	38	8	7.5
12 - 1 pm	1283	1724	1431	1923	3%	5%	6.4%	8.4%	62	91	35	45	8	7.5
1 - 2 pm	1636	1647	1825	1838	4%	6%	6.5%	7.3%	77	110	35	39	8	7.5
2 - 3 pm	2069	1797	2308	2005	5%	6%	9.6%	7.0%	88	120	51	38	8	7.5
3 - 4 pm	3020	1901	3369	2121	7%	6%	9.5%	6.8%	122	104	51	37	6.5	9.2307692
4 - 5 pm	4762	1976	5313	2205	6%	4%	0.0%	10.5%	111	81	0	56	5	12
5 - 6 pm	6075	2297	6778	2563	6%	6%	0.0%	0.0%	108	102	0	0	5	12
6 - 7 pm	3727	1193	4158	1331	6%	7%	6.7%	2.9%	106	128	36	16	7.5	8
7 - 8 pm	2297	797	2563	889	6%	8%	8.9%	8.6%	119	152	48	46	10	6
8 - 9 pm	1936	814	2160	908	6%	8%	6.2%	3.6%	119	152	33	19	10	6
9 - 10 pm	1408	542	1571	605	8%	8%	7.4%	3.8%	157	148	40	21	10	6
10 - 11 pm	1254	401	1399	447	10%	8%	6.7%	4.1%	181	148	36	22	10	6
11 pm - 12 am	859	183	958	204	11%	6%	6.1%	3.9%	201	112	33	21	10	6
12 - 1 am	261	68	291	76	7%	3%	4.5%	3.1%	139	57	24	17	10	6

Accounts for 1/2 hour start of peak period
Assumed
No shift changes during peak hours

NOTE: ALL HEADWAYS ABOVE ARE EXISTING, NO CHANGES MADE TO ACCOUNT FOR NEW TRAIN SETS

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	2323	in	673	Oak Grove	20%	Oak Grove	20%
out	2323	out	673	Back Bay	80%	Back Bay	80%

growth calculation
1.0% per year
11 number of years
11.6% total growth

policy capacity
58 seats per car
225% policy capacity - peak
100% policy capacity - offpeak
131 Car capacity - peak
58 Car capacity - offpeak
6 Cars per train
786 Capacity of train - peak
348 Capacity of train - offpeak

Peak Hours (policy capacity = 225% of # of seats):		
6:30 - 9 am	AM peak	6
9 am - 330 pm	Midday	8
3:30 - 6:30 pm	PM peak	6
630-8 pm	Evening	10
8 pm - close	Late night	10

Capacity Analysis		No-Build	Thursday Wynn	Thursday Build	Friday Wynn	Friday Build	Policy Capacity	No Build < Capacity?	Build < Capacity?
5 - 6 am	nb	341	47	388	53	394	2088	TRUE	TRUE
	sb	1070	31	1101	35	1105	2088	TRUE	TRUE
6 - 7 am	nb	1208	49	1257	55	1263	4536	TRUE	TRUE
	sb	2784	34	2818	38	2822	4536	TRUE	TRUE
7 - 8 am	nb	1874	32	1906	36	1910	9432	TRUE	TRUE
	sb	5835	35	5870	39	5874	9432	TRUE	TRUE
8 - 9 am	nb	1978	26	2004	29	2007	9432	TRUE	TRUE
	sb	7667	43	7710	48	7715	9432	TRUE	TRUE
9 - 10 am	nb	1381	48	1430	54	1436	2610	TRUE	TRUE
	sb	4150	93	4243	104	4254	2610	FALSE	FALSE
10 - 11 am	nb	1140	59	1200	67	1207	2610	TRUE	TRUE
	sb	2334	110	2444	123	2457	2610	TRUE	TRUE
11 am - 12	nb	1254	75	1329	84	1338	2610	TRUE	TRUE
	sb	2009	111	2120	125	2134	2610	TRUE	TRUE
12 - 1 pm	nb	1431	86	1517	97	1528	2610	TRUE	TRUE
	sb	1923	121	2044	136	2059	2610	TRUE	TRUE
1 - 2 pm	nb	1825	100	1925	112	1937	4253	TRUE	TRUE
	sb	1838	133	1971	150	1987	4253	TRUE	TRUE
2 - 3 pm	nb	2308	125	2433	140	2448	5895	TRUE	TRUE
	sb	2005	141	2146	158	2163	5895	TRUE	TRUE
3 - 4 pm	nb	3369	154	3523	173	3542	7255	TRUE	TRUE
	sb	2121	126	2247	141	2262	7255	TRUE	TRUE
4 - 5 pm	nb	5313	98	5411	111	5423	9432	TRUE	TRUE
	sb	2205	122	2327	137	2342	9432	TRUE	TRUE
5 - 6 pm	nb	6778	96	6874	108	6886	9432	TRUE	TRUE
	sb	2563	91	2654	102	2665	9432	TRUE	TRUE
6 - 7 pm	nb	4158	127	4285	142	4300	4536	TRUE	TRUE
	sb	1331	128	1459	144	1475	4536	TRUE	TRUE
7 - 8 pm	nb	2563	149	2712	167	2730	2088	FALSE	FALSE
	sb	889	176	1065	198	1087	2088	TRUE	TRUE
8 - 9 pm	nb	2160	136	2296	153	2313	2088	FALSE	FALSE
	sb	908	152	1060	171	1079	2088	TRUE	TRUE
9 - 10 pm	nb	1571	175	1746	197	1768	2088	TRUE	TRUE
	sb	605	150	754	168	773	2088	TRUE	TRUE
10 - 11 pm	nb	1399	194	1593	218	1617	2088	TRUE	TRUE
	sb	447	151	599	170	617	2088	TRUE	TRUE
11 pm - 12	nb	958	208	1167	234	1192	2088	TRUE	TRUE
	sb	204	119	323	133	337	2088	TRUE	TRUE
12 - 1 am	nb	291	146	437	164	455	2088	TRUE	TRUE
	sb	76	66	142	74	150	2088	TRUE	TRUE

Data for Orange Line Build Conditions Weekday Ridership Graph
North Station to Community College
Calculated by Howard/Stein-Hudson Associates
24-Sep-14

	Existing - Year 2012		No Build - Year 2023		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Patrons Wynn Project Trips (using Orange Line at Wellington)		Employees Wynn Project Trips (using Orange Line at Wellington)		Headway	Trains per Hour
	northbound	southbound	northbound	southbound	entering	exiting	entering	exiting	entering	exiting	entering	exiting		
5 - 6 am	145	253	162	282	1%	3%	1.1%	0.3%	29	60	7	2	10	6
6 - 7 am	245	615	273	686	2%	3%	1.1%	1.5%	34	62	7	10	10	6
7 - 8 am	407	900	454	1004	2%	2%	1.6%	2.1%	34	54	10	14	10	6
8 - 9 am	873	1039	974	1159	2%	2%	2.0%	3.5%	42	43	13	23	10	6
9 - 10 am	526	1563	587	1744	3%	2%	4.3%	7.6%	68	49	28	50	10	6
10 - 11 am	657	1379	733	1539	4%	2%	5.4%	7.9%	84	50	35	51	10	6
11 am - 12 pm	801	1729	894	1929	5%	3%	5.7%	7.1%	102	67	37	46	10	6
12 - 1 pm	865	1758	965	1961	6%	3%	6.4%	8.4%	123	77	41	54	10	6
1 - 2 pm	849	1466	947	1636	6%	4%	6.4%	7.3%	143	95	42	47	10	6
2 - 3 pm	1063	1416	1186	1580	7%	5%	6.6%	7.0%	161	115	43	46	10	6
3 - 4 pm	1336	1415	1491	1579	7%	5%	6.5%	6.8%	145	107	42	44	9	6.6666667
4 - 5 pm	1545	1306	1724	1457	8%	6%	6.4%	6.8%	170	133	42	44	8	7.5
5 - 6 pm	1669	1088	1862	1214	6%	6%	4.9%	5.0%	133	133	32	33	8	7.5
6 - 7 pm	1451	853	1619	952	6%	6%	4.4%	5.8%	124	138	29	38	9	6.6666667
7 - 8 pm	1279	785	1427	876	7%	5%	6.6%	4.5%	156	119	43	29	10	6
8 - 9 pm	1122	601	1252	671	5%	6%	6.1%	3.6%	105	125	40	23	10	6
9 - 10 pm	1122	480	1252	536	6%	8%	7.4%	3.8%	125	169	48	25	10	6
10 - 11 pm	1209	496	1349	553	7%	10%	6.7%	4.1%	149	223	43	27	10	6
11 pm - 12 am	1111	316	1240	353	8%	8%	6.0%	3.9%	187	180	39	25	10	6
12 - 1 am	539	130	601	145	4%	9%	4.5%	3.1%	95	209	29	20	10	6

Total Patron Trips		Total Employee Trips		Patron Origin %		Employee Origin %	
in	2760	in	814	Oak Grove	20%	Oak Grove	20%
out	2760	out	814	Back Bay	80%	Back Bay	80%

Accounts for 1/2 hour start of peak period

Assumed

NOTE: ALL HEADWAYS ABOVE ARE EXISTING, NO CHANGES MADE TO ACCOUNT FOR NEW TRAIN SETS

growth calculation		policy capacity		Peak Hours (policy capacity = 225% of # of seats):		
1.0%	per year	58	seats per car	6:30 - 9 am	AM peak	
11	number of years	100%	policy capacity - offpeak	3:30 - 6:30 pm	PM peak	
		58	Car capacity			
11.6%	total growth	6	Cars per train	6:30 - 9 am	AM peak	10
		348	Capacity of train - offpeak	9 am - 330 pm	Midday	10
		224	Crush capacity per car	3:30 - 6:30 pm	PM peak	8
				630-8 pm	Evening	10
				8 pm - close	Late night	10

Capacity Analysis		No-Build	Wynn	Build	Policy Capacity	No Build < Capacity?	Build < Capacity?
	nb	162	36	198	2088	TRUE	TRUE
5 - 6 am	sb	282	62	344	2088	TRUE	TRUE
	nb	273	41	315	2088	TRUE	TRUE
6 - 7 am	sb	686	71	758	2088	TRUE	TRUE
	nb	454	44	498	2088	TRUE	TRUE
7 - 8 am	sb	1004	68	1072	2088	TRUE	TRUE
	nb	974	55	1029	2088	TRUE	TRUE
8 - 9 am	sb	1159	66	1225	2088	TRUE	TRUE
	nb	587	96	683	2088	TRUE	TRUE
9 - 10 am	sb	1744	99	1842	2088	TRUE	TRUE
	nb	733	119	852	2088	TRUE	TRUE
10 - 11 am	sb	1539	101	1639	2088	TRUE	TRUE
	nb	894	139	1033	2088	TRUE	TRUE
11 am - 12	sb	1929	113	2042	2088	TRUE	TRUE
	nb	965	164	1129	2088	TRUE	TRUE
12 - 1 pm	sb	1961	131	2093	2088	TRUE	FALSE
	nb	947	184	1132	2088	TRUE	TRUE
1 - 2 pm	sb	1636	143	1778	2088	TRUE	TRUE
	nb	1186	204	1390	2088	TRUE	TRUE
2 - 3 pm	sb	1580	160	1740	2088	TRUE	TRUE
	nb	1491	187	1678	2320	TRUE	TRUE
3 - 4 pm	sb	1579	151	1730	2320	TRUE	TRUE
	nb	1724	211	1935	2610	TRUE	TRUE
4 - 5 pm	sb	1457	178	1635	2610	TRUE	TRUE
	nb	1862	165	2027	2610	TRUE	TRUE
5 - 6 pm	sb	1214	166	1380	2610	TRUE	TRUE
	nb	1619	153	1772	2320	TRUE	TRUE
6 - 7 pm	sb	952	176	1128	2320	TRUE	TRUE
	nb	1427	199	1626	2088	TRUE	TRUE
7 - 8 pm	sb	876	148	1024	2088	TRUE	TRUE
	nb	1252	145	1397	2088	TRUE	TRUE
8 - 9 pm	sb	671	148	819	2088	TRUE	TRUE
	nb	1252	173	1425	2088	TRUE	TRUE
9 - 10 pm	sb	536	193	729	2088	TRUE	TRUE
	nb	1349	193	1542	2088	TRUE	TRUE
10 - 11 pm	sb	553	250	803	2088	TRUE	TRUE
	nb	1240	226	1466	2088	TRUE	TRUE
11 pm - 12	sb	353	205	558	2088	TRUE	TRUE
	nb	601	124	725	2088	TRUE	TRUE
12 - 1 am	sb	145	229	374	2088	TRUE	TRUE

Bus Route Load Capacity Analysis

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	06:30 (90 .0) [9] !Fall 2012!					07:10 (90 .0) [6] !Fall 2012!					07:50 (90 .0) [9] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	7	0	0		7	1.8	0	0		1.8	3.4	0	0		3.4
2 - 2582 - ELM ST @ CHESTER ST	1.4		0.7		7.7	2.4		0		4.2	1.8		0		5.2
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0		0		7.7	0.2		0		4.4	0.2		0		5.4
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.1		0		7.8	1.7		0		6.1	1.4		0		6.8
5 - 2676 - HIGHLAND AVE @ CHERRY ST	1.6		0.1		9.3	1.3		0.8		6.6	0.9		0		7.7
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.4		0.1		9.6	1		0		7.6	0.7		0.1		8.3
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0.1		0		9.7	0.2		0		7.8	0		0		8.3
8 - 2679 - HIGHLAND AVE @ TOWER ST.	0.1		0.4		9.4	1.7		0.7		8.8	0.8		0.4		8.7
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.9		0		10.3	0.5		0		9.3	2.4		0.1		11
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.9		0		11.2	0.5		0		9.8	0.2		0		11.2
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	4.4		4		11.6	0.8		0.3		10.3	3.3		0.2		14.3
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.7		0.1		12.2	1.5		0.2		11.6	0.2		0.1		14.4
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	1.7		0.6		13.3	0.8		3.5		8.9	2.9		0.7		16.6
14 - 2686 - HIGHLAND AVE @ VINAL AVE	1.2		0		14.5	1.2		0.2		9.9	0.3		0		16.9
15 - 2687 - HIGHLAND AVE @ WALNUT ST	1.6		0.4		15.7	2.8		0		12.7	2		0.1		18.8
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0		0		15.7	0.5		0.2		13	0.4		0.1		19.1
17 - 2689 - 422 MCGRATH HWY	0		0.1		15.6	0.2		0		13.2	0.2		0.2		19.1
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.8		0.4		16	0.8		0.2		13.8	0.5		0		19.6
19 - 2392 - CROSS ST @ ALSTON ST	0		0		16	0.5		0		14.3	0		0.4		19.2
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.9		0		16.9	0.7		0.7		14.3	1.4		1.3		19.3
21 - 2393 - CROSS ST @ OLIVER ST	0.6		0		17.5	2		0		16.3	1.6		0		20.9
22 - 2745 - CROSS ST @ PEARL ST	1.4		0		18.9	1		0.2		17.1	0.7		0.4		21.2
23 - 2746 - CROSS ST @ ELLSWORTH ST	2.3		0		21.2	0		0.3		16.8	0.2		0.3		21.1
24 - 2747 - CROSS ST @ BROADWAY	1.1		0		22.3	4.2		0		21	0.2		0.2		21.1
25 - 2711 - BROADWAY @ GLEN ST	0.4		0.9		21.8	1.2		0		22.2	1.4		0.1		22.4
26 - 2712 - BROADWAY @ FRANKLIN ST	0.4		2.8		19.4	1.5		0		23.7	1		0		23.4
27 - 2713 - BROADWAY @ LINCOLN ST	0.8		0.8		19.4	1.7		4.8		20.6	0.9		0		24.3
28 - 2714 - BROADWAY @ MT VERNON ST	0.1		0		19.5	0		0		20.6	0.1		0		24.4
29 - 2874 - SULLIVAN STATION - UPPER BUSW	2.3		15		6.8	3.3		18.7		5.2	1.6		21.3		4.7
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		6.8	0		0		5.2	0		0		4.7
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		6.8	0		0		5.2	0		0		4.7
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		2.3		4.5	0		1		4.2	0		0.9		3.8
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	0		2		2.5	0		2.5		1.7	0		2.3		1.5
34 - 5271 - WELLINGTON STATION BUSWAY	0		3.2	0	-0.7	0		3.5	0	-1.8	0		4	0	-2.5
Maximum					22.3					23.7					24.4
Total	33.3		34			35.9		37.7			30.9		33.4		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	08:30 (90 .0) [5] !Fall 2012!					09:15 (90 .0) [8] !Fall 2012!					10:25 (90 .0) [9] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	4.6	0	0		4.6	6.8	1	0		7.8	3.6	1	0		4.6
2 - 2582 - ELM ST @ CHESTER ST	1		0		5.6	1.4		0		9.2	4.7		0		9.3
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0		0		5.6	0.4		0		9.6	0.3		0		9.6
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0		0		5.6	0.3		0		9.9	0.2		0		9.8
5 - 2676 - HIGHLAND AVE @ CHERRY ST	1.2		0		6.8	0.1		0.3		9.7	0.1		0		9.9
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.8		0		7.6	1.4		0		11.1	0.4		0.1		10.2
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		7.6	0.4		0		11.5	0.1		0		10.3
8 - 2679 - HIGHLAND AVE @ TOWER ST.	1.2		1.2		7.6	1.3		0.9		11.9	2.8		0.4		12.7
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.6		0.2		8	1.1		0.3		12.7	1.9		0.4		14.2
10 - 2681 - HIGHLAND AVE @ BENTON RD	1.4		0		9.4	0.1		0.4		12.4	0		0.3		13.9
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1.6		0.6		10.4	1.9		0.6		13.7	1.2		0.4		14.7
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.6		0		11	0.1		0		13.8	0.4		0.6		14.5
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0.8		1		10.8	0.5		0.1		14.2	1.8		1.2		15.1
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.2		0.2		10.8	1		0.1		15.1	0.7		0.1		15.7
15 - 2687 - HIGHLAND AVE @ WALNUT ST	2		0		12.8	2.3		0.4		17	1.7		1		16.4
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.2		0		13	0.5		0		17.5	0.3		0.3		16.4
17 - 2689 - 422 MCGRATH HWY	0		0		13	0.4		0		17.9	0		0		16.4
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.2		0.4		12.8	0.2		0.5		17.6	0.7		0.6		16.5
19 - 2392 - CROSS ST @ ALSTON ST	0		0		12.8	0		0		17.6	0		0		16.5
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.2		0.2		12.8	0.5		0		18.1	0		0.2		16.3
21 - 2393 - CROSS ST @ OLIVER ST	1.6		0		14.4	0.4		0		18.5	0.3		0.3		16.3
22 - 2745 - CROSS ST @ PEARL ST	0		0		14.4	1.9		0.3		20.1	0		0.6		15.7
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0.2		14.2	0.3		0		20.4	0.1		0.2		15.6
24 - 2747 - CROSS ST @ BROADWAY	1.4		0.2		15.4	1.5		0.1		21.8	0.6		0.4		15.8
25 - 2711 - BROADWAY @ GLEN ST	0.4		0		15.8	0.9		0.1		22.6	0.3		0.2		15.9
26 - 2712 - BROADWAY @ FRANKLIN ST	0.2		0.6		15.4	0.4		0.4		22.6	1		1.2		15.7
27 - 2713 - BROADWAY @ LINCOLN ST	0.6		0		16	0.3		0.1		22.8	0.1		0		15.8
28 - 2714 - BROADWAY @ MT VERNON ST	0.2		0.6		15.6	0.1		0.4		22.5	0.2		0.2		15.8
29 - 2874 - SULLIVAN STATION - UPPER BUSW	3.6		13.2		6	4.5		15.6		11.4	3.1		11.9		7
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		6	0		0		11.4	0		0		7
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		6	0.1		0		11.5	0.1		0		7.1
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		2.8		3.2	0		1.9		9.6	0		1.9		5.2
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	0		4.6		-1.4	0.5		4.8		5.3	1.2		6.1		0.3
34 - 5271 - WELLINGTON STATION BUSWAY	0		3.8	0	-5.2	0		5.6	1	-1.3	0		0.2	1	-0.9
Maximum					16					22.8					16.5
Total	24.6		29.8			31.2		32.8			28		29.1		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	11:35 (90 .0) [9] !Fall 2012!					12:45 (90 .0) [11] !Fall 2012!					13:25 (90 .0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	5.2	1	0		6.2	7.9	1	0		8.9	7.5	1	0		8.5
2 - 2582 - ELM ST @ CHESTER ST	4.6		0.4		10.4	7.6		0.2		16.3	4.5		0		13
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0.8		0		11.2	1		0		17.3	0.1		0		13.1
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0		0		11.2	0.2		0		17.5	0.1		0		13.2
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0		0		11.2	0.4		0.1		17.8	0.1		0.1		13.2
6 - 2677 - HIGHLAND AVE @ CEDAR ST	1.1		0.2		12.1	0.6		0.4		18	0.5		0		13.7
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		12.1	0.1		0.1		18	0		0		13.7
8 - 2679 - HIGHLAND AVE @ TOWER ST.	2.6		0.1		14.6	1.4		0.6		18.8	1.1		0.5		14.3
9 - 2680 - HIGHLAND AVE @ LOWELL ST	1.2		0.7		15.1	0.8		0.5		19.1	0.4		0.4		14.3
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.1		0.1		15.1	0.1		0.3		18.9	0.1		0.3		14.1
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	2.7		1.1		16.7	1.4		1		19.3	1.3		0.8		14.6
12 - 2683 - HIGHLAND AVE @ TRULL LN	0		0.2		16.5	0.1		0.4		19	0.3		1.1		13.8
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	2		0.9		17.6	1.6		0.4		20.2	0.5		0.6		13.7
14 - 2686 - HIGHLAND AVE @ VINAL AVE	1.2		0.2		18.6	1		0.3		20.9	0.4		0.1		14
15 - 2687 - HIGHLAND AVE @ WALNUT ST	2		1.3		19.3	0.5		1.3		20.1	1.4		1		14.4
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.7		0.1		19.9	0.3		0		20.4	0		0.3		14.1
17 - 2689 - 422 MCGRATH HWY	0.1		0		20	0		0.4		20	0		0		14.1
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.7		0.3		20.4	0.2		0.8		19.4	0.4		0		14.5
19 - 2392 - CROSS ST @ ALSTON ST	0		0		20.4	0.1		0.3		19.2	0		0		14.5
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.2		0.3		20.3	0.2		0.7		18.7	0		0.1		14.4
21 - 2393 - CROSS ST @ OLIVER ST	0.1		0		20.4	0.3		0.2		18.8	0.1		0.6		13.9
22 - 2745 - CROSS ST @ PEARL ST	0.1		0.6		19.9	1.1		0.7		19.2	0.6		0.5		14
23 - 2746 - CROSS ST @ ELLSWORTH ST	0.1		0.2		19.8	0.4		0.5		19.1	0.3		0.4		13.9
24 - 2747 - CROSS ST @ BROADWAY	0.3		0.6		19.5	0.9		1		19	1		0.4		14.5
25 - 2711 - BROADWAY @ GLEN ST	0.4		0.4		19.5	0.2		0.3		18.9	0.5		0.4		14.6
26 - 2712 - BROADWAY @ FRANKLIN ST	0.3		1.1		18.7	0.9		0.7		19.1	0.1		0.4		14.3
27 - 2713 - BROADWAY @ LINCOLN ST	0.4		0.4		18.7	0.1		0.6		18.6	0.1		2.4		12
28 - 2714 - BROADWAY @ MT VERNON ST	0		0		18.7	0.1		0.3		18.4	0.3		0.6		11.7
29 - 2874 - SULLIVAN STATION - UPPER BUSW	4.2		12.3		10.6	2.5		10.7		10.2	4.5		7.1		9.1
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		10.6	0		0		10.2	0		0.5		8.6
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		10.6	0.1		0		10.3	0		0		8.6
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		1.3		9.3	0.1		1.6		8.8	0.1		0.4		8.3
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	0.9		5.6		4.6	1.5		4.5		5.8	1		3.4		5.9
34 - 5271 - WELLINGTON STATION BUSWAY	0		5.6	1	-2	0		4.4	1	0.4	0		5.1	1	-0.2
Maximum					20.4					20.9					14.6
Total	32.1		34.2			33.7		33.1			27.3		27.4		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	14:05 (90 .0) [11] !Fall 2012!					15:00 (90 .0) [12] !Fall 2012!					15:45 (90 .0) [19] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	8.8	2	0		10.8	9.9	1	0		10.9	8.2	1	0		9.2
2 - 2582 - ELM ST @ CHESTER ST	6.4		0.2		17	4.8		0.2		15.5	5.4		0.2		14.4
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	1.2		0		18.2	0.6		0.1		16	0.6		0		15
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.4		0.1		18.5	0.3		0		16.3	0.2		0.1		15.1
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.2		0		18.7	1		0.1		17.2	0.4		0.1		15.4
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.9		0.2		19.4	1.1		0.3		18	0.7		0.2		15.9
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0.1		0		19.5	0.2		0		18.2	0.1		0.2		15.8
8 - 2679 - HIGHLAND AVE @ TOWER ST.	2.5		0.8		21.2	4.6		0.7		22.1	2.3		0.1		18
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.5		0.4		21.3	1.9		0.3		23.7	0.6		0.5		18.1
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.2		0.4		21.1	0.5		0.4		23.8	0.6		0.6		18.1
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1.5		0.8		21.8	3.5		1.2		26.1	2.1		0.6		19.6
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.1		0.5		21.4	0		0.3		25.8	0.1		0.4		19.3
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	1.1		2.7		19.8	1.3		1.1		26	1.1		1.2		19.2
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.2		0.5		19.5	0.7		0.6		26.1	0.4		0.2		19.4
15 - 2687 - HIGHLAND AVE @ WALNUT ST	0.6		2.1		18	2.9		1.3		27.7	1.3		1.4		19.3
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.1		0.5		17.6	0.4		0.3		27.8	0.2		0.2		19.3
17 - 2689 - 422 MCGRATH HWY	0		0.2		17.4	0		0.1		27.7	0.1		0.1		19.3
18 - 2659 - MCGRATH HWY @ ALSTON ST	0		0.7		16.7	0.5		0.4		27.8	0.8		0.8		19.3
19 - 2392 - CROSS ST @ ALSTON ST	0		0.3		16.4	0.3		0.3		27.8	0.2		0		19.5
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.2		0.6		16	0.3		0.5		27.6	0		0.9		18.6
21 - 2393 - CROSS ST @ OLIVER ST	0		0.1		15.9	0.3		0.3		27.6	0.2		0.4		18.4
22 - 2745 - CROSS ST @ PEARL ST	0.5		0.8		15.6	0.2		0.3		27.5	0.5		0.9		18
23 - 2746 - CROSS ST @ ELLSWORTH ST	0.3		0.2		15.7	0.3		0.6		27.2	0.1		0.6		17.5
24 - 2747 - CROSS ST @ BROADWAY	0.6		1		15.3	0.3		1		26.5	0.7		1		17.2
25 - 2711 - BROADWAY @ GLEN ST	0.4		0.1		15.6	1		1.7		25.8	0.4		0.7		16.9
26 - 2712 - BROADWAY @ FRANKLIN ST	0.4		0.4		15.6	0.8		1.4		25.2	1.4		0.9		17.4
27 - 2713 - BROADWAY @ LINCOLN ST	0.1		0.2		15.5	0.5		0.3		25.4	0.2		0.2		17.4
28 - 2714 - BROADWAY @ MT VERNON ST	0.1		0.6		15	0.2		0.5		25.1	0		0		17.4
29 - 2874 - SULLIVAN STATION - UPPER BUSW	2.1		7.1		10	1.3		12.9		13.5	3.4		7.9		12.9
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		10	0		0		13.5	0		0		12.9
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		10	0		0		13.5	0.1		0		13
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		0.5		9.5	0		0.6		12.9	0.1		0.7		12.4
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	1.7		2.6		8.6	1.6		4.8		9.7	2.7		6.1		9
34 - 5271 - WELLINGTON STATION BUSWAY	0		6	2	0.6	0		10	1	-1.3	0		8.4	1	-0.4
Maximum					21.8					27.8					19.6
Total	31.1		30.6			41.2		42.2			35		35.3		

Massachusetts Bay Transportation Authority

Route 90

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	16:35 (90 .0) [12] !Fall 2012!					17:15 (90 .0) [19] !Fall 2012!					18:10 (90 .0) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	7.8	0	0		7.8	9.8	0	0		9.8	6.7	0	0		6.7
2 - 2582 - ELM ST @ CHESTER ST	3.3		0.2		10.9	5.7		0.2		15.3	6.5		0.1		13.1
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0.3		0		11.2	1.1		0.1		16.3	0.5		0		13.6
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.1		0.2		11.1	0.5		0		16.8	0.4		0		14
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.4		0		11.5	0.7		0.2		17.3	0.7		0.2		14.5
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.5		0.1		11.9	0.3		0.3		17.3	0.9		0.8		14.6
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0.2		11.7	0.1		0.6		16.8	0.2		0.3		14.5
8 - 2679 - HIGHLAND AVE @ TOWER ST.	2.3		0.3		13.7	1.6		0.2		18.2	1.2		0.4		15.3
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.3		0.5		13.5	0.8		0.5		18.5	0.3		1.7		13.9
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.1		0.2		13.4	0.4		0.4		18.5	0.3		0.8		13.4
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1		0.6		13.8	1.7		1.6		18.6	1.5		2.8		12.1
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.1		0.3		13.6	0.2		1.1		17.7	0.2		1.6		10.7
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	2.1		0.4		15.3	0.7		0.8		17.6	1		1.6		10.1
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.6		0		15.9	0.6		0.9		17.3	0.3		0.8		9.6
15 - 2687 - HIGHLAND AVE @ WALNUT ST	1		0.8		16.1	1		1.7		16.6	0.9		1.6		8.9
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.3		0.4		16	0.4		0.6		16.4	0.1		0.2		8.8
17 - 2689 - 422 MCGRATH HWY	0		0.1		15.9	0.1		0.1		16.4	0		0.5		8.3
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.9		0.2		16.6	0.4		0.2		16.6	0.7		0		9
19 - 2392 - CROSS ST @ ALSTON ST	0.2		0.2		16.6	0		0		16.6	0		0.2		8.8
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.1		0.3		16.4	0.3		0.9		16	0		0.9		7.9
21 - 2393 - CROSS ST @ OLIVER ST	0.3		0.6		16.1	0.3		0.4		15.9	0		0.3		7.6
22 - 2745 - CROSS ST @ PEARL ST	0.6		0.8		15.9	0.3		0.9		15.3	0.2		1.3		6.5
23 - 2746 - CROSS ST @ ELLSWORTH ST	0.3		0.2		16	0.4		0.4		15.3	0.1		0.5		6.1
24 - 2747 - CROSS ST @ BROADWAY	0.3		1.2		15.1	0.9		0.5		15.7	0.3		1.2		5.2
25 - 2711 - BROADWAY @ GLEN ST	0.8		1.6		14.3	0.2		0.4		15.5	0.2		0.4		5
26 - 2712 - BROADWAY @ FRANKLIN ST	0.8		0.8		14.3	0.9		1.1		15.3	0		1.3		3.7
27 - 2713 - BROADWAY @ LINCOLN ST	0.2		1.4		13.1	0.1		0.2		15.2	0.4		1.5		2.6
28 - 2714 - BROADWAY @ MT VERNON ST	0.2		0.7		12.6	0.1		0.8		14.5	0		0.1		2.5
29 - 2874 - SULLIVAN STATION - UPPER BUSW	7.9		9.8		10.7	3.7		10.7		7.5	4.3		3.9		2.9
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		10.7	0.2		0.1		7.6	0		0		2.9
31 - 2717 - MAIN ST @ DORRANCE ST	0.1		0		10.8	0		0		7.6	0		0		2.9
32 - 28742 - STURTEVANT ST @ FOLEY ST	1		0.9		10.9	0.1		0.5		7.2	0		0.3		2.6
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	6.2		6.8		10.3	3		3.1		7.1	4.6		4.5		2.7
34 - 5271 - WELLINGTON STATION BUSWAY	0		11.8	0	-1.5	0		9	0	-1.9	0		7.6	0	-4.9
Maximum					16.6					18.6					15.3
Total	40.1		41.3			36.6		38.6			32.2		37.2		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	18:50 (90 .0) [19] !Fall 2012!					19:30 (90 .0) [10] !Fall 2012!					20:35 (90 .0) [8] !Fall 2012!			
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
1 - 5104 - DAVIS SQUARE BUSWAY	9.2	1	0		10.2	6.7	2	0		8.7	12.8	1	0	
2 - 2582 - ELM ST @ CHESTER ST	6		0.1		16.1	4		0		12.7	3.9		0.4	
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	1.4		0.3		17.2	0.3		0.1		12.9	0		0	
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.2		0		17.4	0.2		0		13.1	0.3		0	
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.8		0.2		18	0.4		0.1		13.4	0.1		0	
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.6		0.6		18	0		0.4		13	0.3		0.6	
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0.2		0.6		17.6	0		0.1		12.9	0		0	
8 - 2679 - HIGHLAND AVE @ TOWER ST.	0.5		0.3		17.8	0.4		0.2		13.1	1.3		0.4	
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.5		1.1		17.2	0.1		0.4		12.8	0.9		1.4	
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.1		0.7		16.6	0.1		0.2		12.7	0		0.4	
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	0.6		3.1		14.1	1		1.6		12.1	0.1		1	
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.1		1.2		13	0.1		0.3		11.9	0		0.8	
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0.3		0.9		12.4	0.2		1.3		10.8	0.4		0.8	
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.1		0.8		11.7	0.2		1		10	0.5		0.5	
15 - 2687 - HIGHLAND AVE @ WALNUT ST	0.7		1.6		10.8	0.5		0.9		9.6	0.4		2.3	
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.1		0.3		10.6	0.1		0		9.7	0.1		0.8	
17 - 2689 - 422 MCGRATH HWY	0		0.1		10.5	0.2		0.3		9.6	0		0	
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.1		0.2		10.4	0.4		0.1		9.9	0		0	
19 - 2392 - CROSS ST @ ALSTON ST	0.4		0		10.8	0		0		9.9	0		0.3	
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0		0.5		10.3	0		0.9		9	0		0.3	
21 - 2393 - CROSS ST @ OLIVER ST	0.2		0.7		9.8	0		0.2		8.8	0		0.3	
22 - 2745 - CROSS ST @ PEARL ST	0.4		1.2		9	0		0.8		8	0		1	
23 - 2746 - CROSS ST @ ELLSWORTH ST	0.3		1		8.3	0		0.1		7.9	0.1		0.9	
24 - 2747 - CROSS ST @ BROADWAY	0.1		0.5		7.9	0		1.3		6.6	0.1		2.1	
25 - 2711 - BROADWAY @ GLEN ST	0.1		0.1		7.9	0		0.4		6.2	0		0.1	
26 - 2712 - BROADWAY @ FRANKLIN ST	0.6		0.5		8	0		0.6		5.6	0.1		0.3	
27 - 2713 - BROADWAY @ LINCOLN ST	0.2		0.7		7.5	0.2		0.2		5.6	0		0.4	
28 - 2714 - BROADWAY @ MT VERNON ST	0		0.2		7.3	0		1.7		3.9	0.3		0.3	
29 - 2874 - SULLIVAN STATION - UPPER BUSW	1.6		5.2		3.7	1.4		4.3		1	0.8		4	
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		3.7	0		0		1	0		0	
31 - 2717 - MAIN ST @ DORRANCE ST	0.1		0		3.8	0		0		1	0		0	
32 - 28742 - STURTEVANT ST @ FOLEY ST	0.1		0.2		3.7	0		0		1	0		0	
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	1.5		1.7		3.5	1.4		2.2		0.2	0.6		1	
34 - 5271 - WELLINGTON STATION BUSWAY	0		5.7	1	-3.2	0		0	2	-1.8	0		3.5	1
Maximum					18					13.4				
Total	26.7		30.1			17.9		19.7			22.9		23.4	

Massachusetts Bay Transportation Authority
Route 90
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

		21:40 (90 .0) [7] !Fall 2012!					Total		
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 5104 - DAVIS SQUARE BUSWAY	13.8	10	1	0		11	137.7	0	151.7
2 - 2582 - ELM ST @ CHESTER ST	17.3	7.6		0.1		18.5	83	3	231.7
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	17.3	0.1		0		18.6	9.1	0.6	240.2
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	17.6	0.3		0.1		18.8	6.9	0.5	246.6
5 - 2676 - HIGHLAND AVE @ CHERRY ST	17.7	0.6		0.3		19.1	11	2.6	255
6 - 2677 - HIGHLAND AVE @ CEDAR ST	17.4	0.1		0.1		19.1	12.3	4.5	262.8
7 - 2678 - HIGHLAND AVE @ CONWELL ST	17.4	0.1		0.3		18.9	1.9	2.4	262.3
8 - 2679 - HIGHLAND AVE @ TOWER ST.	18.3	1		0.9		19	30.7	9.5	283.5
9 - 2680 - HIGHLAND AVE @ LOWELL ST	17.8	0.7		1.1		18.6	16.4	10.5	289.4
10 - 2681 - HIGHLAND AVE @ BENTON RD	17.4	0		0.7		17.9	5.7	6.2	288.9
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	16.5	0.9		1.9		16.9	32.5	24.2	297.2
12 - 2683 - HIGHLAND AVE @ TRULL LN	15.7	0		1.1		15.8	4.8	10.3	291.7
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	15.3	0.6		0.7		15.7	21.4	20.5	292.6
14 - 2686 - HIGHLAND AVE @ VINAL AVE	15.3	0.3		1.7		14.3	11.1	8.2	295.5
15 - 2687 - HIGHLAND AVE @ WALNUT ST	13.4	0.4		2		12.7	26	21.2	300.3
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	12.7	0.1		0.1		12.7	4.8	4.4	300.7
17 - 2689 - 422 MCGRATH HWY	12.7	0		0.1		12.6	1.3	2.3	299.7
18 - 2659 - MCGRATH HWY @ ALSTON ST	12.7	0		0		12.6	8.3	5.8	302.2
19 - 2392 - CROSS ST @ ALSTON ST	12.4	0.2		0.2		12.6	1.9	2.2	301.9
20 - 23921 - CROSS ST @ FOUNTAIN AVE	12.1	0		0.8		11.8	5	10.1	296.8
21 - 2393 - CROSS ST @ OLIVER ST	11.8	0.1		0.9		11	8.4	5.3	299.9
22 - 2745 - CROSS ST @ PEARL ST	10.8	0		0.1		10.9	9.5	11.4	298
23 - 2746 - CROSS ST @ ELLSWORTH ST	10	0		0.6		10.3	5.6	7.2	296.4
24 - 2747 - CROSS ST @ BROADWAY	8	0.1		0.7		9.7	14.6	13.4	297.6
25 - 2711 - BROADWAY @ GLEN ST	7.9	0.1		0.4		9.4	8.9	8.3	298.2
26 - 2712 - BROADWAY @ FRANKLIN ST	7.7	0.1		0.3		9.2	10.9	14.8	294.3
27 - 2713 - BROADWAY @ LINCOLN ST	7.3	0		0.3		8.9	6.9	14.5	286.7
28 - 2714 - BROADWAY @ MT VERNON ST	7.3	0		0.4		8.5	2	7.4	281.3
29 - 2874 - SULLIVAN STATION - UPPER BUSW	4.1	0.7		3.9		5.3	56.8	195.5	142.6
30 - 28740 - NOT A STOP FOR ITINERARY	4.1	0		0		5.3	0.2	0.6	142.2
31 - 2717 - MAIN ST @ DORRANCE ST	4.1	0		0		5.3	0.6	0	142.8
32 - 28742 - STURTEVANT ST @ FOLEY ST	4.1	0		0		5.3	1.5	17.8	126.5
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	3.7	3.4		0.7		8	31.8	69.3	89
34 - 5271 - WELLINGTON STATION BUSWAY	-0.8	0		6.7	1	0.3	0	104.1	-29.1
Maximum	18.3					19.1	0	0	370.1
Total		27.7		27.4			588.4	617.3	0

Massachusetts Bay Transportation Authority
Route 90
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Fall 2012
(Urban Transportation Associates)

	07:10 (90 .0) [9] !Fall 2012!					07:50 (90 .0) [5] !Fall 2012!					08:30 (90 .0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	4.6	0	0		4.6	3.3	0	0		3.3	3.7	1	0		4.7
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0.1		4.6	0		0		3.3	0.1		0		4.8
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	1.8		0.7		5.7	0		1.6		1.7	0.8		1.4		4.2
4 - 28743 - STURTEVANT ST @ FOLEY ST	0		0.2		5.5	0		0		1.7	0.4		0.1		4.5
5 - 2714 - BROADWAY @ MT VERNON ST	0		0		5.5	0		0		1.7	0.9		0.1		5.3
6 - 2874 - SULLIVAN STATION - UPPER BUSW	8.3		1.8		12	3.6		0.4		4.9	4.3		0.3		9.3
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		12	0		0		4.9	0		0		9.3
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		12	0		0		4.9	0		0		9.3
9 - 2718 - BROADWAY @ AUSTIN ST	6.9		0		18.9	1.6		0		6.5	1.3		0		10.6
10 - 2719 - BROADWAY @ INDIANA AVE	1.7		1.9		18.7	0		0		6.5	0.5		0		11.1
11 - 2720 - BROADWAY @ MICHIGAN AVE	5		0.4		23.3	2.4		0.2		8.7	0.6		0.1		11.6
12 - 2748 - CROSS ST @ BROADWAY	3.6		0.2		26.7	0.6		0.4		8.9	1.3		0.4		12.5
13 - 2749 - CROSS ST @ OTIS ST	1.7		1.6		26.8	1.4		0		10.3	0.9		0.1		13.3
14 - 2750 - CROSS ST @ PEARL ST	3.8		0		30.6	4		0		14.3	0.3		0.4		13.2
15 - 2752 - CROSS ST @ FLINT ST	1.2		0.2		31.6	0.6		0		14.9	0.3		0		13.5
16 - 2753 - CROSS ST @ AUBURN AVE	0.2		0		31.8	0.4		0		15.3	1.8		0.1		15.2
17 - 2754 - CROSS ST @ CHESTER AVE	0.2		0.1		31.9	0		0.4		14.9	0.1		0		15.3
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.9		0.1		32.7	0.2		0		15.1	0.4		0.1		15.6
19 - 2661 - HIGHLAND AVE @ WALNUT ST	2.3		0.4		34.6	3.4		0.4		18.1	1.5		0.1		17
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	1.1		17.9		17.8	1		0.6		18.5	1.1		0.1		18
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	1.8		2.7		16.9	2.4		1.8		19.1	0.5		0.9		17.6
22 - 2665 - 125 HIGHLAND AVE	2.1		0.1		18.9	4.8		0.2		23.7	0.8		0		18.4
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	4.4		0.6		22.7	2.8		1.2		25.3	3		1.3		20.1
24 - 2667 - HIGHLAND AVE @ BENTON RD	1.6		0.3		24	4		0.4		28.9	1.8		0.1		21.8
25 - 2668 - HIGHLAND AVE @ LOWELL ST	3.9		0.3		27.6	2.8		0.2		31.5	1.1		0.6		22.3
26 - 2669 - 235 HIGHLAND AVE	0.8		1		27.4	0.6		1		31.1	1.1		2.4		21
27 - 2670 - 263 HIGHLAND AVE	1.7		0		29.1	1.8		0		32.9	0.5		0.1		21.4
28 - 2671 - HIGHLAND AVE @ CEDAR ST	1.2		0.3		30	1		0.2		33.7	1.3		0.5		22.2
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0.7		3		27.7	0.2		1.2		32.7	0.3		0		22.5
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0.7		1.2		27.2	0.4		0.2		32.9	0		0.3		22.2
31 - 2628 - GROVE ST @ HIGHLAND AVE	0.2		1.6		25.8	0.2		3.4		29.7	0.1		3.1		19.2
32 - 5104 - DAVIS SQUARE BUSWAY	0		27.2	0	-1.4	0		25.8	0	3.9	0		16.9	1	1.3
Maximum					34.6					33.7					22.5
Total	62.4		63.9			43.5		39.6			30.4		29.5		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	09:15 (90 .0) [6] !Fall 2012!					09:55 (90 .0) [9] !Fall 2012!					11:05 (90 .0) [9] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	3.7	0	0		3.7	3.8	1	0		4.8	4.6	2	0		6.6
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		3.7	0.4		0.1		5.1	0		0		6.6
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	1.5		1.7		3.5	1.9		0.8		6.2	4.3		2.6		8.3
4 - 28743 - STURTEVANT ST @ FOLEY ST	0.2		0		3.7	0.3		1.4		5.1	1.4		0.8		8.9
5 - 2714 - BROADWAY @ MT VERNON ST	0.3		0		4	0		0		5.1	0		0.6		8.3
6 - 2874 - SULLIVAN STATION - UPPER BUSW	6.7		1.2		9.5	5.7		1.2		9.6	5.1		2.5		10.9
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		9.5	0		0.2		9.4	0		0		10.9
8 - 2717 - MAIN ST @ DORRANCE ST	0		0.2		9.3	0.2		0.2		9.4	0		0		10.9
9 - 2718 - BROADWAY @ AUSTIN ST	1.2		0.2		10.3	1.1		0.3		10.2	0.5		0		11.4
10 - 2719 - BROADWAY @ INDIANA AVE	2		0.3		12	1.1		0.3		11	0.1		0.1		11.4
11 - 2720 - BROADWAY @ MICHIGAN AVE	0.8		0.2		12.6	1		0.2		11.8	0.7		0.1		12
12 - 2748 - CROSS ST @ BROADWAY	1.2		1.2		12.6	1.1		0.1		12.8	0.7		0.7		12
13 - 2749 - CROSS ST @ OTIS ST	0.2		0.2		12.6	0.7		0		13.5	0.7		0.6		12.1
14 - 2750 - CROSS ST @ PEARL ST	0.2		0.7		12.1	1.3		0.4		14.4	1.1		0.4		12.8
15 - 2752 - CROSS ST @ FLINT ST	0.5		0.2		12.4	0.3		0.2		14.5	0.2		0.1		12.9
16 - 2753 - CROSS ST @ AUBURN AVE	1.5		0.7		13.2	0.7		0.1		15.1	0		0.4		12.5
17 - 2754 - CROSS ST @ CHESTER AVE	0		0		13.2	0.2		0.4		14.9	0		0.3		12.2
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0		0		13.2	0.2		0.2		14.9	0.1		0.3		12
19 - 2661 - HIGHLAND AVE @ WALNUT ST	1.3		0		14.5	0.8		0.6		15.1	1.9		1.2		12.7
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.2		1.3		13.4	0.2		0.7		14.6	0.8		0.2		13.3
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.8		1.2		13	0.9		0.3		15.2	2		0.4		14.9
22 - 2665 - 125 HIGHLAND AVE	0.7		0		13.7	0.8		0		16	1		0		15.9
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.8		1.3		13.2	1.4		1.3		16.1	0.8		1.9		14.8
24 - 2667 - HIGHLAND AVE @ BENTON RD	0		0.7		12.5	0.2		0		16.3	0		0		14.8
25 - 2668 - HIGHLAND AVE @ LOWELL ST	1.2		0.3		13.4	0.9		0.6		16.6	0.3		1.6		13.5
26 - 2669 - 235 HIGHLAND AVE	0.5		2		11.9	0.9		1		16.5	1.1		1		13.6
27 - 2670 - 263 HIGHLAND AVE	0.2		0		12.1	0.3		0.4		16.4	0		0		13.6
28 - 2671 - HIGHLAND AVE @ CEDAR ST	1		0.7		12.4	0.3		1.1		15.6	0.7		0.7		13.6
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0.3		12.1	0.1		0.2		15.5	0		0.9		12.7
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.2		11.9	0.1		0.4		15.2	0.1		0.6		12.2
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		4.2		7.7	0.1		2.6		12.7	0		3.3		8.9
32 - 5104 - DAVIS SQUARE BUSWAY	0		9.7	0	-2	0		12.6	1	-0.9	0		10.3	2	-3.4
Maximum					14.5					16.6					15.9
Total	26.5		28.4			27.1		28.1			28.3		31.5		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	12:15 (90 .0) [11] !Fall 2012!					13:25 (90 .0) [11] !Fall 2012!					14:05 (90 .0) [12] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	5.7	1	0		6.7	4.1	1	0		5.1	2.9	1	0		3.9
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.2		0		6.9	0.7		0.3		5.5	0.3		0.2		4
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	4.8		2.2		9.5	4.2		1		8.7	5.2		1.9		7.3
4 - 28743 - STURTEVANT ST @ FOLEY ST	1.4		0.1		10.8	0.5		0.1		9.1	3.5		0.5		10.3
5 - 2714 - BROADWAY @ MT VERNON ST	0.3		0.2		10.9	0.1		0.5		8.7	0		0		10.3
6 - 2874 - SULLIVAN STATION - UPPER BUSW	10.5		5.5		15.9	8		3.6		13.1	5.4		6.5		9.2
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		15.9	0		0		13.1	0		0		9.2
8 - 2717 - MAIN ST @ DORRANCE ST	0.3		0		16.2	0		0		13.1	0		0		9.2
9 - 2718 - BROADWAY @ AUSTIN ST	0.5		0.3		16.4	0.9		0.1		13.9	0.4		0		9.6
10 - 2719 - BROADWAY @ INDIANA AVE	0.7		0.5		16.6	0.3		0.5		13.7	0.8		0.6		9.8
11 - 2720 - BROADWAY @ MICHIGAN AVE	1.2		0.4		17.4	1.4		0.2		14.9	0.3		0		10.1
12 - 2748 - CROSS ST @ BROADWAY	1		0.9		17.5	0.9		0.5		15.3	0.3		0.7		9.7
13 - 2749 - CROSS ST @ OTIS ST	0.3		0.6		17.2	0.8		0.4		15.7	0.6		1.2		9.1
14 - 2750 - CROSS ST @ PEARL ST	1.1		0.5		17.8	0.1		0.3		15.5	1.3		0		10.4
15 - 2752 - CROSS ST @ FLINT ST	0.2		0.2		17.8	0.1		0.1		15.5	0.3		0.3		10.4
16 - 2753 - CROSS ST @ AUBURN AVE	0.5		0.1		18.2	0.5		0.5		15.5	0.3		0.2		10.5
17 - 2754 - CROSS ST @ CHESTER AVE	0.1		0.2		18.1	0		0.3		15.2	0		0.1		10.4
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.1		0.3		17.9	0.2		0.1		15.3	0.4		0.3		10.5
19 - 2661 - HIGHLAND AVE @ WALNUT ST	3.5		1.3		20.1	1.6		1.2		15.7	2.8		0.5		12.8
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.4		0.2		20.3	0.5		0.4		15.8	0.3		1		12.1
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	1.5		0.5		21.3	0.3		0.4		15.7	3.4		0.6		14.9
22 - 2665 - 125 HIGHLAND AVE	0.9		0		22.2	0.3		0.5		15.5	1		0.4		15.5
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	2.5		1.5		23.2	0.5		0.9		15.1	2.3		1.8		16
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.3		0.5		23	0.2		0		15.3	0.8		0.2		16.6
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.8		0.9		22.9	0.1		1.1		14.3	0.5		0.3		16.8
26 - 2669 - 235 HIGHLAND AVE	1		2.2		21.7	1		3.3		12	1.4		1.5		16.7
27 - 2670 - 263 HIGHLAND AVE	0.3		0.1		21.9	0.5		0.1		12.4	0.3		0.6		16.4
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.3		0.3		21.9	0.1		1.1		11.4	0.1		0.5		16
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		1.1		20.8	0.5		0.7		11.2	0		0.3		15.7
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.5		20.3	0		0.5		10.7	0		1.1		14.6
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		4.8		15.5	0		2.6		8.1	0		2.8		11.8
32 - 5104 - DAVIS SQUARE BUSWAY	0		14.5	1	3.6E-15	0		9	1	-1.9	0		14.7	1	-3.9
Maximum					23.2					15.8					16.8
Total	39.8		40.1			28.2		30.2			34.9		38.5		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
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	Trip (RouteVar) [Observations]														
	15:00 (90 .0) [9] !Fall 2012!					15:50 (90 .0) [12] !Fall 2012!					16:30 (90 .0) [19] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	4	1	0		5	3.3	0	0		3.3	4.3	2	0		6.3
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0		5.3	0.3		0.2		3.4	0.5		0.4		6.4
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	6.6		2.6		9.3	2.8		2.3		3.9	9.1		2.6		12.9
4 - 28743 - STURTEVANT ST @ FOLEY ST	1.3		0.1		10.5	1		0		4.9	1.5		0.1		14.3
5 - 2714 - BROADWAY @ MT VERNON ST	0		0		10.5	0.1		0.4		4.6	0.2		0.6		13.9
6 - 2874 - SULLIVAN STATION - UPPER BUSW	9.1		5.1		14.5	6.3		1.5		9.4	9.3		8.5		14.7
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		14.5	0		0		9.4	0		0		14.7
8 - 2717 - MAIN ST @ DORRANCE ST	0.3		0		14.8	0.3		0		9.7	0.1		0		14.8
9 - 2718 - BROADWAY @ AUSTIN ST	0.3		0.3		14.8	0.2		0.3		9.6	0.1		0.1		14.8
10 - 2719 - BROADWAY @ INDIANA AVE	0.3		0.2		14.9	1.3		0.3		10.6	0.3		0.3		14.8
11 - 2720 - BROADWAY @ MICHIGAN AVE	0.2		0.4		14.7	0.2		0.3		10.5	0.1		0.2		14.7
12 - 2748 - CROSS ST @ BROADWAY	0.3		0.7		14.3	0.3		0.3		10.5	0.4		0.6		14.5
13 - 2749 - CROSS ST @ OTIS ST	0.2		0.3		14.2	0.2		0.6		10.1	0.1		0.6		14
14 - 2750 - CROSS ST @ PEARL ST	0.3		0.1		14.4	0.4		1.2		9.3	0.2		0.6		13.6
15 - 2752 - CROSS ST @ FLINT ST	0.8		0		15.2	0		0.3		9	0		0.6		13
16 - 2753 - CROSS ST @ AUBURN AVE	0.9		0.7		15.4	0.6		0.7		8.9	0.3		0.8		12.5
17 - 2754 - CROSS ST @ CHESTER AVE	0.1		0.4		15.1	0		0.1		8.8	0		0.1		12.4
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.2		0.2		15.1	0.5		0.6		8.7	0.4		0.4		12.4
19 - 2661 - HIGHLAND AVE @ WALNUT ST	1.4		1.8		14.7	1.8		1.5		9	0.8		0.6		12.6
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0		0.1		14.6	0.5		0.5		9	0.7		0.6		12.7
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	1.4		0.6		15.4	2.8		0.9		10.9	1.4		1		13.1
22 - 2665 - 125 HIGHLAND AVE	0.1		0.4		15.1	0.3		0.9		10.3	0.3		0.4		13
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.7		0.8		15	1.3		1.3		10.3	1.3		0.8		13.5
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.1		0.2		14.9	0.2		0.3		10.2	0.3		0.2		13.6
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.6		0.9		14.6	0.2		1.1		9.3	0.7		0.8		13.5
26 - 2669 - 235 HIGHLAND AVE	0.3		2.4		12.5	1		0.1		10.2	1.4		0.9		14
27 - 2670 - 263 HIGHLAND AVE	0		0		12.5	0		0		10.2	0.1		0.2		13.9
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.3		0.7		12.1	0.4		0.6		10	0.3		0.7		13.5
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0.4		0.9		11.6	0.7		0.9		9.8	0.1		0.2		13.4
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.3		11.3	0		0.5		9.3	0.1		0.6		12.9
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		2.8		8.5	0		2.6		6.7	0.2		3.1		10
32 - 5104 - DAVIS SQUARE BUSWAY	0		11	1	-3.5	0		9.7	0	-3	0		10.6	2	-2.6
Maximum					15.4					10.9					14.8
Total	30.8		34.1			26.8		29.8			34.3		37.1		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	17:20 (90 .0) [12] !Fall 2012!					18:00 (90 .0) [19] !Fall 2012!					18:50 (90 .0) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	3.2	0	0		3.2	3.1	0	0		3.1	2.6	0	0		2.6
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.6		0.4		3.4	0.5		0.3		3.3	0.2		0.2		2.6
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	13		2.1		14.3	7.6		1.3		9.6	4.5		0.5		6.6
4 - 28743 - STURTEVANT ST @ FOLEY ST	1.7		0		16	0.9		0.1		10.4	1.1		0		7.7
5 - 2714 - BROADWAY @ MT VERNON ST	0.2		0.3		15.9	0		0.2		10.2	0		0.1		7.6
6 - 2874 - SULLIVAN STATION - UPPER BUSW	15.1		11.6		19.4	10		6.2		14	10.5		4.5		13.6
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		19.4	0		0		14	0		0		13.6
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		19.4	0.2		0.1		14.1	0.2		0		13.8
9 - 2718 - BROADWAY @ AUSTIN ST	0.3		0.2		19.5	0.8		0.1		14.8	0.4		0.1		14.1
10 - 2719 - BROADWAY @ INDIANA AVE	0.8		0.9		19.4	0.6		0.3		15.1	0.3		0.2		14.2
11 - 2720 - BROADWAY @ MICHIGAN AVE	0.3		0.6		19.1	0.1		0.5		14.7	0.5		0.1		14.6
12 - 2748 - CROSS ST @ BROADWAY	0.2		1.4		17.9	0.5		1.1		14.1	0.2		1.5		13.3
13 - 2749 - CROSS ST @ OTIS ST	0.5		0.5		17.9	0.1		0.7		13.5	0.4		0.2		13.5
14 - 2750 - CROSS ST @ PEARL ST	0.1		1.3		16.7	0.2		1.4		12.3	0.4		0.9		13
15 - 2752 - CROSS ST @ FLINT ST	0.3		0.9		16.1	0.1		0.8		11.6	0.1		1		12.1
16 - 2753 - CROSS ST @ AUBURN AVE	0.3		0.4		16	0.2		0.6		11.2	0		0.7		11.4
17 - 2754 - CROSS ST @ CHESTER AVE	0		0.8		15.2	0.1		0.6		10.7	0		0.1		11.3
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.1		0.5		14.8	0.2		0.4		10.5	0.1		0		11.4
19 - 2661 - HIGHLAND AVE @ WALNUT ST	1.2		1.3		14.7	0.9		0.8		10.6	1.2		1.1		11.5
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.3		0.8		14.2	0.3		0.3		10.6	0.2		0.6		11.1
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.8		1.2		13.8	0.9		1		10.5	1.7		0.8		12
22 - 2665 - 125 HIGHLAND AVE	0.4		0.9		13.3	0.7		0.8		10.4	0.4		0.5		11.9
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.8		2.5		11.6	0.6		1.5		9.5	0.8		0.9		11.8
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.3		0		11.9	0.2		0.3		9.4	0.1		0.5		11.4
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.1		0.7		11.3	0.3		0.3		9.4	0.5		0.9		11
26 - 2669 - 235 HIGHLAND AVE	0.1		0.7		10.7	0.2		0.2		9.4	0.3		0.4		10.9
27 - 2670 - 263 HIGHLAND AVE	0.2		0.5		10.4	0.1		0.1		9.4	0.1		0.2		10.8
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.2		0.4		10.2	0.1		0.4		9.1	0.1		0.5		10.4
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0.2		0.2		10.2	0.1		0.4		8.8	0.1		0		10.5
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.5		9.7	0		0.5		8.3	0.1		0.6		10
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		2.3		7.4	0		1.7		6.6	0.1		0.4		9.7
32 - 5104 - DAVIS SQUARE BUSWAY	0		8.5	0	-1.1	0		8.2	0	-1.6	0		9.5	0	0.2
Maximum					19.5					15.1					14.6
Total	40.8		42.2			29.4		30.9			26.8		26.9		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	19:35 (90 .0) [19] !Fall 2012!					20:05 (90 .0) [8] !Fall 2012!					21:10 (90 .0) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	3.2	1	0		4.2	3.1	1	0		3.1	4.2	1	0		4.9
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0		4.3	0		0		3.1	0.3		0.2		5.2
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	4.4		0.3		8.4	3		0		6.1	2.9		0.3		8.4
4 - 28743 - STURTEVANT ST @ FOLEY ST	0.7		0.2		8.9	0		0		6.1	0.3		0		8.7
5 - 2714 - BROADWAY @ MT VERNON ST	0.1		0.1		8.9	0		0		6.1	1		0.3		9.4
6 - 2874 - SULLIVAN STATION - UPPER BUSW	8.7		5.2		12.4	14.1		3		17.4	2.7		1		11.1
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		12.4	0		0.3		16.3	0		0		11.3
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		12.4	0		0		16.3	0		0		11.3
9 - 2718 - BROADWAY @ AUSTIN ST	0.3		0.6		12.1	0.5		0.9		16.9	1.3		0.6		11.9
10 - 2719 - BROADWAY @ INDIANA AVE	0.3		0.1		12.3	0.1		0.3		16.8	0.1		0.4		11.6
11 - 2720 - BROADWAY @ MICHIGAN AVE	0.2		0.3		12.2	0.3		1.1		15.9	0.3		0.4		11.4
12 - 2748 - CROSS ST @ BROADWAY	0.2		1.2		11.2	0.1		2.1		13.9	0.1		0.4		11.1
13 - 2749 - CROSS ST @ OTIS ST	0.1		0.9		10.4	0		0.4		13.5	0.1		0.1		11.1
14 - 2750 - CROSS ST @ PEARL ST	0.2		1.7		8.9	0.1		0.6		13	0.3		0.4		11
15 - 2752 - CROSS ST @ FLINT ST	0		0.7		8.2	0		0.5		12.5	0		0		11
16 - 2753 - CROSS ST @ AUBURN AVE	0.3		0.7		7.8	0		0.6		11.9	0		0.3		10.7
17 - 2754 - CROSS ST @ CHESTER AVE	0.2		0.6		7.4	0		0.3		11.6	0		0.2		10.5
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.3		0		7.7	0		0.6		11	0.2		0.7		10
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.6		0.6		7.7	0.6		1.5		10.1	0.1		0.3		10
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.3		1.4		6.6	0		0.4		9.8	0		0		10
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.5		1.6		5.5	0.9		0.9		9.8	0		0.4		9.6
22 - 2665 - 125 HIGHLAND AVE	0.3		1.1		4.7	0.3		0.8		9.3	0		0.1		9.4
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.6		1.4		3.9	0.1		0.5		8.9	0.3		1		8.7
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.1		0.2		3.8	0		0		8.9	0		0		8.7
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.3		1.3		2.8	0.5		0.8		8.6	0		0.1		8.6
26 - 2669 - 235 HIGHLAND AVE	0.3		0.1		3	0.6		0.1		9.1	0		0.3		8.3
27 - 2670 - 263 HIGHLAND AVE	0.3		0.4		2.9	0		0.3		8.9	0.1		0.4		8
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.2		0.6		2.5	0.1		0		9	0		0.1		7.9
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0		2.5	0.1		0.3		8.9	0		0.9		7
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.7		1.8	0		0.1		8.8	0		0		7
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		0.3		1.5	0		1		7.8	0		0.4		6.6
32 - 5104 - DAVIS SQUARE BUSWAY	0		1.7	1	-1.2	0		7.1	1	0.6	0		6.1	1	0.4
Maximum					12.4					17.4					11.9
Total	22.7		24.1			24.6		24.3			14.4		15.6		

Massachusetts Bay Transportation Authority
Route 90
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	22:15 (90 .0) [7] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 5271 - WELLINGTON STATION BUSWAY	2.2	1	0		3.3	69.6	0	82.4
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.6		0.4		3.9	5.2	2.8	85.4
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	3.7		0.1		7.6	82.1	26	142.2
4 - 28743 - STURTEVANT ST @ FOLEY ST	0.1		0		7.7	16.3	3.7	154.8
5 - 2714 - BROADWAY @ MT VERNON ST	0		0		7.7	3.2	3.4	154.6
6 - 2874 - SULLIVAN STATION - UPPER BUSW	10.1		3.1		14.7	153.5	72.7	235.6
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		15.3	0	0.5	235.1
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		15.3	1.6	0.5	236.2
9 - 2718 - BROADWAY @ AUSTIN ST	0.4		0.4		14.7	19	4.5	251
10 - 2719 - BROADWAY @ INDIANA AVE	0.1		0		14.9	11.4	7.2	255.4
11 - 2720 - BROADWAY @ MICHIGAN AVE	0.4		1		14.3	16	6.7	264.5
12 - 2748 - CROSS ST @ BROADWAY	1.3		1.9		13.7	14.3	16.3	262.5
13 - 2749 - CROSS ST @ OTIS ST	0.6		1		13.3	9.6	10	262.1
14 - 2750 - CROSS ST @ PEARL ST	0		0.1		13.1	15.4	11	266.4
15 - 2752 - CROSS ST @ FLINT ST	0		0.9		12.3	5	7	264.5
16 - 2753 - CROSS ST @ AUBURN AVE	0		0.7		11.6	8.5	8.3	264.7
17 - 2754 - CROSS ST @ CHESTER AVE	0.1		1.1		10.6	1.1	6.1	259.7
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.1		2.1		8.6	4.6	6.9	257.4
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.1		2.7		6.1	27.8	17.9	267.6
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0		0.6		5.6	7.9	27.7	248
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.4		2.3		3.7	24.4	19.5	252.9
22 - 2665 - 125 HIGHLAND AVE	0		1.1		2.7	15.2	8.2	259.9
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.3		1.4		1.7	25.3	23.9	261.4
24 - 2667 - HIGHLAND AVE @ BENTON RD	0		0		1.7	10.2	3.9	267.7
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.3		0		2	15.1	12.8	270
26 - 2669 - 235 HIGHLAND AVE	0.3		0		2.3	12.9	20.6	262.3
27 - 2670 - 263 HIGHLAND AVE	0		0		2.3	6.5	3.4	265.5
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.1		0		2.4	7.8	9.4	263.9
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0		2.4	3.5	11.5	256
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.6		1.9	1.5	9.4	248.2
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		0.6		1.3	0.9	43.6	205.5
32 - 5104 - DAVIS SQUARE BUSWAY	0		0.3	1	1	0	213.4	-19.1
Maximum					15.3	0	0	340.9
Total	21.5		22.6			593.2	617.4	0

Massachusetts Bay Transportation Authority
Route 90
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	08:05 (90 .0) [4] !Fall 2012!					09:10 (90 .0) [4] !Fall 2012!					10:20 (90 .0) [4] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	1.7	1	0		2.7	2.2	2	0		4.2	3.2	2	0		5.2
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0.3		2.7	0.2		0		4.4	0.2		0		5.4
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	0		0.5		2.2	0.8		0.5		4.7	3		0.8		7.6
4 - 28743 - STURTEVANT ST @ FOLEY ST	0		0		2.2	0		0.8		3.9	0.8		0		8.4
5 - 2714 - BROADWAY @ MT VERNON ST	0.3		0		2.5	0		0		3.9	0		0		8.4
6 - 2874 - SULLIVAN STATION - UPPER BUSW	2		0.3		4.2	4		0.8		7.1	3.5		2.3		9.6
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		4.2	0		0		7.1	0		0.3		9.3
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		4.2	0		0		7.1	0		0		9.3
9 - 2718 - BROADWAY @ AUSTIN ST	0.8		0		5	1.3		0.3		8.1	1.5		0		10.8
10 - 2719 - BROADWAY @ INDIANA AVE	0		0.3		4.7	0.8		0.3		8.6	0		0.5		10.3
11 - 2720 - BROADWAY @ MICHIGAN AVE	0		0		4.7	1.3		0		9.9	2.3		0		12.6
12 - 2748 - CROSS ST @ BROADWAY	0		0		4.7	0.5		0.5		9.9	0		0.3		12.3
13 - 2749 - CROSS ST @ OTIS ST	0.3		0		5	0.5		0		10.4	0.8		0		13.1
14 - 2750 - CROSS ST @ PEARL ST	1.8		0		6.8	1		0.8		10.6	0.8		0.3		13.6
15 - 2752 - CROSS ST @ FLINT ST	0.8		0		7.6	0.3		0		10.9	1		0		14.6
16 - 2753 - CROSS ST @ AUBURN AVE	0		0		7.6	1		0		11.9	1		0		15.6
17 - 2754 - CROSS ST @ CHESTER AVE	0		0		7.6	0		0		11.9	0.3		0.3		15.6
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0.3		0		7.9	2.3		0.3		13.9	0.3		0.3		15.6
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.8		0		8.7	5.3		0		19.2	1		0		16.6
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.8		0		9.5	0.8		0.3		19.7	0.3		0.8		16.1
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	1.5		0		11	1.5		0.5		20.7	0		1.3		14.8
22 - 2665 - 125 HIGHLAND AVE	0.8		0		11.8	2.3		0		23	0.5		0.3		15
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.3		0.5		11.6	3.8		1		25.8	0.5		0.3		15.2
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.3		0		11.9	1.8		0.5		27.1	0		0.3		14.9
25 - 2668 - HIGHLAND AVE @ LOWELL ST	1.8		0		13.7	1.3		1		27.4	0.3		0.5		14.7
26 - 2669 - 235 HIGHLAND AVE	0		0		13.7	0.5		0.8		27.1	0.3		0		15
27 - 2670 - 263 HIGHLAND AVE	0		0.5		13.2	0.5		0.3		27.3	0		0.3		14.7
28 - 2671 - HIGHLAND AVE @ CEDAR ST	1		0		14.2	0		1		26.3	0		0		14.7
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0		14.2	0		0.5		25.8	0		0.5		14.2
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.3		13.9	0		0		25.8	0		0		14.2
31 - 2628 - GROVE ST @ HIGHLAND AVE	0.3		3.8		10.4	0		11.5		14.3	0		5		9.2
32 - 5104 - DAVIS SQUARE BUSWAY	0		8.3	1	1.1	0		11.8	2	0.5	0		8.3	2	-1.1
Maximum					14.2					27.4					16.6
Total	15.2		14.5		0.7	33.4		33		0.4	21.2		22.1		-0.9

Massachusetts Bay Transportation Authority

Route 90

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

	11:30 (90 .0) [4] !Fall 2012!					12:40 (90 .0) [4] !Fall 2012!					13:50 (90 .0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off		Load
1 - 5271 - WELLINGTON STATION BUSWAY	6.3	1	0		7.3	5.6	2	0		7.6	4.3	2	0		6.3
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		7.3	0		0.3		7.3	0.2		0.2		6.3
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	3.5		2.3		8.5	4.3		4.5		7.1	9		2.3		13
4 - 28743 - STURTEVANT ST @ FOLEY ST	1.8		0		10.3	0.3		0		7.4	0.3		0		13.3
5 - 2714 - BROADWAY @ MT VERNON ST	0		0		10.3	0		2.3		5.1	0		0		13.3
6 - 2874 - SULLIVAN STATION - UPPER BUSW	7		3.3		14	8		2		11.1	6		5.3		14
7 - 28740 - NOT A STOP FOR ITINERARY	.		.		14	0		0		11.1	0		0		14
8 - 2717 - MAIN ST @ DORRANCE ST	.		.		14	0		0		11.1	0		0		14
9 - 2718 - BROADWAY @ AUSTIN ST	0		0		14	1		1		11.1	0.5		0		14.5
10 - 2719 - BROADWAY @ INDIANA AVE	2.3		0.7		15.6	1		0		12.1	0.5		0.3		14.7
11 - 2720 - BROADWAY @ MICHIGAN AVE	1.3		0.3		16.6	1.8		0		13.9	1		1		14.7
12 - 2748 - CROSS ST @ BROADWAY	1.8		0.2		18.2	1.3		2.3		12.9	1.5		1		15.2
13 - 2749 - CROSS ST @ OTIS ST	0		0.5		17.7	0		0		12.9	0.8		0		16
14 - 2750 - CROSS ST @ PEARL ST	0.5		0.3		17.9	0.5		0.3		13.1	1.5		0.5		17
15 - 2752 - CROSS ST @ FLINT ST	2		0.3		19.6	0		0		13.1	1		0.8		17.2
16 - 2753 - CROSS ST @ AUBURN AVE	0.3		0		19.9	0.3		0		13.4	0.3		0.3		17.2
17 - 2754 - CROSS ST @ CHESTER AVE	0		0		19.9	0.3		1.3		12.4	0		0		17.2
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0		0		19.9	0.3		1		11.7	0		1		16.2
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.5		0.8		19.6	0.3		0		12	3.8		0.3		19.7
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	1		0.5		20.1	0		0.3		11.7	0.5		0.3		19.9
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	1.3		1		20.4	0		0		11.7	0.8		0.3		20.4
22 - 2665 - 125 HIGHLAND AVE	0.3		0		20.7	0		0.8		10.9	1		0.3		21.1
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	1		0.8		20.9	0.5		0.8		10.6	2.8		3.8		20.1
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.5		0.3		21.1	0		0		10.6	1		1.3		19.8
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.5		0		21.6	0		0.3		10.3	0.3		0.3		19.8
26 - 2669 - 235 HIGHLAND AVE	0		0.8		20.8	0.3		0		10.6	1.5		0		21.3
27 - 2670 - 263 HIGHLAND AVE	0.5		0		21.3	0		0		10.6	0		0.8		20.5
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.3		1.3		20.3	0.3		0.3		10.6	0.5		0.5		20.5
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0.5		19.8	0		0		10.6	0		0.8		19.7
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0		19.8	0		0.3		10.3	0		1		18.7
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		7.5		12.3	0		2		8.3	0		5		13.7
32 - 5104 - DAVIS SQUARE BUSWAY	0		10.3	1	1	0		11	2	-4.7	0		12.8		0.9
Maximum					21.6					13.9					21.3
Total	32.4		31.2		1.2	25.7		30.4			38.8		39.4		

Massachusetts Bay Transportation Authority
Route 90
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	15:00 (90 .0) [5] !Fall 2012!					16:10 (90 .0) [5] !Fall 2012!					17:20 (90 .0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	4	1	0		5	5.4	1	0		6.4	10.3	1	0		11.3
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0.1		5	0		0		6.4	1.3		0		12.6
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	8.2		3		10.2	9.2		2		13.6	6		3.3		15.3
4 - 28743 - STURTEVANT ST @ FOLEY ST	0.2		0		10.4	0		0		13.6	1.7		0		17
5 - 2714 - BROADWAY @ MT VERNON ST	0		0.2		10.2	0		0		13.6	0		2.3		14.7
6 - 2874 - SULLIVAN STATION - UPPER BUSW	6.4		3.8		12.8	3		4.8		11.8	7.3		2.7		19.3
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		12.8	0		0		11.8	0		1		18.3
8 - 2717 - MAIN ST @ DORRANCE ST	0.3		0		13.1	0		0		11.8	0		0		18.3
9 - 2718 - BROADWAY @ AUSTIN ST	1.2		0.6		13.7	1		0		12.8	0		0.7		17.6
10 - 2719 - BROADWAY @ INDIANA AVE	0.4		0.8		13.3	0.6		0		13.4	0		0		17.6
11 - 2720 - BROADWAY @ MICHIGAN AVE	1.2		0.2		14.3	0		0.4		13	0.7		1		17.3
12 - 2748 - CROSS ST @ BROADWAY	0		1.6		12.7	0		0.2		12.8	0.3		2.7		14.9
13 - 2749 - CROSS ST @ OTIS ST	0.2		0		12.9	0.2		0.2		12.8	0.3		0.3		14.9
14 - 2750 - CROSS ST @ PEARL ST	0.4		0.4		12.9	1.2		0		14	0.3		1		14.2
15 - 2752 - CROSS ST @ FLINT ST	0		0.4		12.5	0.2		0		14.2	0.7		2		12.9
16 - 2753 - CROSS ST @ AUBURN AVE	1.6		0.4		13.7	2.2		1		15.4	0		0		12.9
17 - 2754 - CROSS ST @ CHESTER AVE	0		0		13.7	0		1		14.4	0		0.3		12.6
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0		0		13.7	0.7		0.7		14.4	0		0		12.6
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.8		0.8		13.7	0.4		0.6		14.2	0.7		0.3		13
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0.2		0.6		13.3	0		0.2		14	0		0.7		12.3
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.6		0.2		13.7	0.6		1		13.6	1		0.7		12.6
22 - 2665 - 125 HIGHLAND AVE	0.6		0.4		13.9	0		0.4		13.2	0.7		0		13.3
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	1.4		0.8		14.5	1.4		0.6		14	0.3		1.3		12.3
24 - 2667 - HIGHLAND AVE @ BENTON RD	0.6		0		15.1	0.2		0.2		14	0		0		12.3
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.4		0.2		15.3	0.2		1.2		13	0		1		11.3
26 - 2669 - 235 HIGHLAND AVE	0.4		0.2		15.5	0		0.8		12.2	0.7		0		12
27 - 2670 - 263 HIGHLAND AVE	0.2		0		15.7	0.6		0		12.8	0.7		0		12.7
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.4		0		16.1	0.4		0.6		12.6	0		0		12.7
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0.6		0.4		16.3	0		0.4		12.2	0		0		12.7
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.2		16.1	0		0.4		11.8	0.3		0		13
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		8.2		7.9	0		2.6		9.2	0		3		10
32 - 5104 - DAVIS SQUARE BUSWAY	0		8.4	1	-1.5	0		9.4	1	-1.2	0		7.7	1	1.3
Maximum					16.3					15.4					19.3
Total	30.5		31.9			27.5		28.7			33.3		32		1.3

Massachusetts Bay Transportation Authority
Route 90
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:30 (90 .0) [3] !Fall 2012!					19:40 (90 .0) [3] !Fall 2012!					20:50 (90 .0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5271 - WELLINGTON STATION BUSWAY	2.3	1	0		3.3	2.3	1	0		3.3	1.8	2	0		3.8
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		3.3	0		0		3.3	0		0		3.8
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	10		0.3		13	3.7		0		7	2.7		0		6.5
4 - 28743 - STURTEVANT ST @ FOLEY ST	0.7		0		13.7	0		0		7	0		0		6.5
5 - 2714 - BROADWAY @ MT VERNON ST	0		0.3		13.4	0		0		7	0		0		6.5
6 - 2874 - SULLIVAN STATION - UPPER BUSW	8.3		3.7		18	6		1.7		11.3	9.3		1.7		14.1
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		18	0		0		11.3	0		0		14.1
8 - 2717 - MAIN ST @ DORRANCE ST	0		0.5		17.5	0.3		0		11.6	0.3		0		14.4
9 - 2718 - BROADWAY @ AUSTIN ST	1.7		1.3		17.9	0.7		0		12.3	1.7		0		16.1
10 - 2719 - BROADWAY @ INDIANA AVE	0.3		0.3		17.9	1.3		0		13.6	0		0		16.1
11 - 2720 - BROADWAY @ MICHIGAN AVE	0		0.3		17.6	1		0.3		14.3	0		0.3		15.8
12 - 2748 - CROSS ST @ BROADWAY	0		1.3		16.3	0		0.7		13.6	0.3		2.3		13.8
13 - 2749 - CROSS ST @ OTIS ST	0.7		0.7		16.3	0		0.3		13.3	0		0		13.8
14 - 2750 - CROSS ST @ PEARL ST	2		1		17.3	0		0.3		13	1.3		0.3		14.8
15 - 2752 - CROSS ST @ FLINT ST	0		0.3		17	0		0.3		12.7	0.3		0.3		14.8
16 - 2753 - CROSS ST @ AUBURN AVE	1		0		18	1		0.7		13	1		0		15.8
17 - 2754 - CROSS ST @ CHESTER AVE	0.3		0.7		17.6	0		1.5		11.5	0		0.5		15.3
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0		0		17.6	0		0		11.5	0		0		15.3
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.7		0		18.3	1.3		0.7		12.1	0		0		15.3
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0		0		18.3	0		0.3		11.8	0		0		15.3
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0.3		0.7		17.9	1.7		0.7		12.8	2		2.3		15
22 - 2665 - 125 HIGHLAND AVE	1		1		17.9	0		0.3		12.5	1.3		0		16.3
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	1		2.7		16.2	1.7		1		13.2	0		3.7		12.6
24 - 2667 - HIGHLAND AVE @ BENTON RD	0		0		16.2	0		0		13.2	0.3		0		12.9
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.3		0.7		15.8	1		1.3		12.9	0.3		0		13.2
26 - 2669 - 235 HIGHLAND AVE	0		0		15.8	0.7		0.3		13.3	0		0		13.2
27 - 2670 - 263 HIGHLAND AVE	0		0		15.8	0		0		13.3	0		0		13.2
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0.7		0		16.5	0.3		0.7		12.9	0		0.7		12.5
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0.7		15.8	0		0		12.9	0		0		12.5
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.3		15.5	0.3		0.7		12.5	0		1		11.5
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		1.7		13.8	0		3		9.5	0		0.7		10.8
32 - 5104 - DAVIS SQUARE BUSWAY	0		12.7	1	0.1	0		9	1	-0.5	0		12	2	-3.2
Maximum					18.3					14.3					16.3
Total	31.3		31.2		0.1	23.3		23.8		-0.5	22.8		25.8		-3

Massachusetts Bay Transportation Authority
Route 90
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	22:00 (90 .0) [3] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 5271 - WELLINGTON STATION BUSWAY	1.4	1	0		2.4	50.8	0	68.8
2 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		2.4	2.3	0.9	70.2
3 - 32879 - ASSEMBLY SQUARE MALL @ BED BA	6.7		0		9.1	67.1	19.5	117.8
4 - 28743 - STURTEVANT ST @ FOLEY ST	0		0		9.1	5.8	0.8	122.8
5 - 2714 - BROADWAY @ MT VERNON ST	0		0		9.1	0.3	5.1	118
6 - 2874 - SULLIVAN STATION - UPPER BUSW	3.3		5.3		7.1	74.1	37.7	154.4
7 - 28740 - NOT A STOP FOR ITINERARY	0		0		7.1	0	1.3	153.1
8 - 2717 - MAIN ST @ DORRANCE ST	0		0		7.1	0.9	0.5	153.5
9 - 2718 - BROADWAY @ AUSTIN ST	0.7		0		7.8	12.1	3.9	161.7
10 - 2719 - BROADWAY @ INDIANA AVE	0		0		7.8	7.2	3.2	165.7
11 - 2720 - BROADWAY @ MICHIGAN AVE	0		0		7.8	10.6	3.8	172.5
12 - 2748 - CROSS ST @ BROADWAY	0.3		0		8.1	6	13.1	165.4
13 - 2749 - CROSS ST @ OTIS ST	0.3		0		8.4	4.1	2	167.5
14 - 2750 - CROSS ST @ PEARL ST	0.3		0.3		8.4	11.6	5.5	173.6
15 - 2752 - CROSS ST @ FLINT ST	0.3		1.7		7	6.6	6.1	174.1
16 - 2753 - CROSS ST @ AUBURN AVE	0		0.7		6.3	9.7	3.1	180.7
17 - 2754 - CROSS ST @ CHESTER AVE	0		0		6.3	0.9	5.6	176
18 - 2660 - HIGHLAND AVE @ MEDFORD ST	0		0.7		5.6	3.9	4	175.9
19 - 2661 - HIGHLAND AVE @ WALNUT ST	0.3		0		5.9	15.9	3.5	188.3
20 - 2662 - 75 HIGHLAND AVE OPP PUTNAM ST	0		0		5.9	3.6	4	187.9
21 - 2664 - HIGHLAND AVE @ SCHOOL ST	0		0.3		5.6	11.3	9	190.2
22 - 2665 - 125 HIGHLAND AVE	0		0		5.6	8.5	3.5	195.2
23 - 2666 - HIGHLAND AVE @ CENTRAL ST	0.3		1.7		4.2	15	19	191.2
24 - 2667 - HIGHLAND AVE @ BENTON RD	0		0		4.2	4.7	2.6	193.3
25 - 2668 - HIGHLAND AVE @ LOWELL ST	0.7		0		4.9	7.1	6.5	193.9
26 - 2669 - 235 HIGHLAND AVE	0		0		4.9	4.4	2.9	195.4
27 - 2670 - 263 HIGHLAND AVE	0		0		4.9	2.5	1.9	196
28 - 2671 - HIGHLAND AVE @ CEDAR ST	0		0		4.9	3.9	5.1	194.8
29 - 2672 - HIGHLAND AVE @ CHERRY ST	0		0		4.9	0.6	3.8	191.6
30 - 2673 - HIGHLAND AVE @ WILLOW AVE	0		0.3		4.6	0.6	4.5	187.7
31 - 2628 - GROVE ST @ HIGHLAND AVE	0		0		4.6	0.3	54	134
32 - 5104 - DAVIS SQUARE BUSWAY	0		5.7	1	-2.1	0	127.4	-9.4
Maximum					9.1	0	0	224
Total	14.7		16.7		-2	350.1	360.7	-2.7

Massachusetts Bay Transportation Authority
Route 90
Saturday - Inbound
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(Urban Transportation Associates)

	07:30 (90 .0) [4] !Fall 2012!					08:40 (90 .0) [4] !Fall 2012!					09:45 (90 .0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	1.5	0	0		1.5	2.6	0	0		2.6	4.8	1	0		5.8
2 - 2582 - ELM ST @ CHESTER ST	0.5		0		2	0.4		0		3	0.8		0		6.6
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0		0		2	0		0		3	0		0		6.6
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.3		0		2.3	0		0		3	0.5		0		7.1
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.5		0		2.8	0		0		3	0.8		0		7.9
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.5		0		3.3	0.5		0		3.5	1		0		8.9
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		3.3	0		0		3.5	0		0		8.9
8 - 2679 - HIGHLAND AVE @ TOWER ST.	0		0		3.3	0.5		0		4	0		0.5		8.4
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.8		0		4.1	1.5		0		5.5	0		0.5		7.9
10 - 2681 - HIGHLAND AVE @ BENTON RD	0		0		4.1	0		0		5.5	0		0		7.9
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1.3		0		5.4	1.8		0		7.3	1.3		0		9.2
12 - 2683 - HIGHLAND AVE @ TRULL LN	0		0		5.4	0		0		7.3	0.5		0.3		9.4
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0.3		0.5		5.2	1		0.3		8	0		0		9.4
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.5		0		5.7	0		0		8	0.3		0		9.7
15 - 2687 - HIGHLAND AVE @ WALNUT ST	1.3		0		7	1.3		0		9.3	2		0.5		11.2
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0.5		0.8		6.7	0.5		0		9.8	0		0		11.2
17 - 2689 - 422 MCGRATH HWY	0.5		0		7.2	0		0		9.8	0.5		0.3		11.4
18 - 2659 - MCGRATH HWY @ ALSTON ST	0		0		7.2	0.5		0.3		10	1		0		12.4
19 - 2392 - CROSS ST @ ALSTON ST	0		0.3		6.9	0		0		10	0		0		12.4
20 - 23921 - CROSS ST @ FOUNTAIN AVE	1.7		0		8.6	0		0		10	0.7		0		13.1
21 - 2393 - CROSS ST @ OLIVER ST	0.3		0		8.9	0		0		10	0.3		0.3		13.1
22 - 2745 - CROSS ST @ PEARL ST	1.3		0		10.2	0.3		0		10.3	0.3		0.5		12.9
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0		10.2	0		0.3		10	0.3		0.5		12.7
24 - 2747 - CROSS ST @ BROADWAY	0		0		10.2	0.3		0.3		10	0		0.5		12.2
25 - 2711 - BROADWAY @ GLEN ST	0.3		0		10.5	0.3		0.3		10	0		0		12.2
26 - 2712 - BROADWAY @ FRANKLIN ST	0.5		0.5		10.5	1.8		0.5		11.3	1.3		2		11.5
27 - 2713 - BROADWAY @ LINCOLN ST	0		0		10.5	0		0		11.3	0.5		0.5		11.5
28 - 2714 - BROADWAY @ MT VERNON ST	0		0.3		10.2	0		0.5		10.8	0		1.8		9.7
29 - 2874 - SULLIVAN STATION - UPPER BUSW	1		8		3.2	3		6.3		7.5	1.8		4.8		6.7
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		3.2	0		0		7.5	0		0		6.7
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		3.2	0		0		7.5	0		0		6.7
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		0.3		2.9	0		1.5		6	0		1.5		5.2
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	0		0.5		2.4	0		5.3		0.7	0.8		3		3
34 - 5271 - WELLINGTON STATION BUSWAY	0		1.8	0	-1.8	0		3.3	0	-3.3	0		3.8	1	-4.8
Maximum					10.5					11.3					13.1
Total	13.2		12.8			16		18.5			19		21		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	10:55 (90 .0) [4] !Fall 2012!					12:05 (90 .0) [4] !Fall 2012!					13:15 (90 .0) [4] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	6	2	0		8	7.3	1	0		8.3	6	1	0		7
2 - 2582 - ELM ST @ CHESTER ST	3.8		1		10.8	2.8		0.3		10.8	6.3		0.3		13
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0.5		0		11.3	0.5		0		11.3	0.3		0		13.3
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	1		0		12.3	0.3		0		11.6	1		0		14.3
5 - 2676 - HIGHLAND AVE @ CHERRY ST	1.3		0.3		13.3	0		0		11.6	0		0		14.3
6 - 2677 - HIGHLAND AVE @ CEDAR ST	1.3		0.3		14.3	0.5		0		12.1	0.3		0		14.6
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		14.3	0		0		12.1	0		0		14.6
8 - 2679 - HIGHLAND AVE @ TOWER ST.	1.3		0.3		15.3	1		0		13.1	0.5		0.3		14.8
9 - 2680 - HIGHLAND AVE @ LOWELL ST	1.3		0.3		16.3	1.5		0		14.6	0		0.3		14.5
10 - 2681 - HIGHLAND AVE @ BENTON RD	1		0.3		17	0		0		14.6	0.3		0.8		14
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1.3		1		17.3	1.5		0		16.1	1		1		14
12 - 2683 - HIGHLAND AVE @ TRULL LN	0		0.5		16.8	0.3		0		16.4	0		0.5		13.5
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	1		1.8		16	2		0		18.4	0.5		2.5		11.5
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.5		0		16.5	0		0.3		18.1	0.3		0		11.8
15 - 2687 - HIGHLAND AVE @ WALNUT ST	1		2		15.5	0.3		0.8		17.6	2.8		1.3		13.3
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0		0.5		15	0.3		0.3		17.6	0.3		0.5		13.1
17 - 2689 - 422 MCGRATH HWY	0.3		0		15.3	0		0.5		17.1	0		0		13.1
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.8		0.5		15.6	0		0.8		16.3	0		0.7		12.4
19 - 2392 - CROSS ST @ ALSTON ST	0.3		0		15.9	0		0		16.3	0		0		12.4
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0		0.3		15.6	0.3		0.3		16.3	0		0.7		11.7
21 - 2393 - CROSS ST @ OLIVER ST	1		0.3		16.3	0.8		0		17.1	0.7		0.3		12.1
22 - 2745 - CROSS ST @ PEARL ST	0.5		0.3		16.5	0		0.3		16.8	1.5		0		13.6
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0.3		16.2	0		0		16.8	0.3		0.3		13.6
24 - 2747 - CROSS ST @ BROADWAY	0		0		16.2	0		1.5		15.3	2.3		0.5		15.4
25 - 2711 - BROADWAY @ GLEN ST	1		0.3		16.9	0.3		0.5		15.1	0.3		0.8		14.9
26 - 2712 - BROADWAY @ FRANKLIN ST	0.8		1.5		16.2	0.5		0.8		14.8	1		0.5		15.4
27 - 2713 - BROADWAY @ LINCOLN ST	0.5		0.3		16.4	0		0.3		14.5	0		0		15.4
28 - 2714 - BROADWAY @ MT VERNON ST	0		0		16.4	0.3		0		14.8	0.5		0.3		15.6
29 - 2874 - SULLIVAN STATION - UPPER BUSW	1.8		8.5		9.7	2.8		7.3		10.3	3.5		7		12.1
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		9.7	0		0		10.3	0		0		12.1
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		9.7	0		0		10.3	0		0		12.1
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		0.3		9.4	0		0.3		10	0		0.8		11.3
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	0.5		4.3		5.6	1.5		5.3		6.2	3.8		5.8		9.3
34 - 5271 - WELLINGTON STATION BUSWAY	0		3.8	2	-5.8	0		4.8	1	-5.8	0		9	1	-10
Maximum					17.3					18.4					15.6
Total	28.3		28.3			24.3		23.8			32.9		33.7		

Massachusetts Bay Transportation Authority
Route 90
Saturday - Inbound
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	Trip (RouteVar) [Observations]														
	14:25 (90 .0) [4] !Fall 2012!					15:35 (90 .0) [5] !Fall 2012!					16:45 (90 .0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	5.3	1	0		6.3	6	1	0		7	9.2	1	0		10.2
2 - 2582 - ELM ST @ CHESTER ST	4.8		0.5		10.6	8.4		0		15.4	5.4		0		15.6
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0.3		0		10.9	0.8		0		16.2	1.2		0		16.8
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.3		0		11.2	0.2		0		16.4	0		0		16.8
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.3		0.3		11.2	0.2		0.2		16.4	0.8		0		17.6
6 - 2677 - HIGHLAND AVE @ CEDAR ST	1		0		12.2	0		0		16.4	1.8		1.2		18.2
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		12.2	0		0		16.4	0.2		0.4		18
8 - 2679 - HIGHLAND AVE @ TOWER ST.	1.5		0.3		13.4	0.8		0		17.2	1		0.4		18.6
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0.8		0.3		13.9	0.4		0.4		17.2	0		0.4		18.2
10 - 2681 - HIGHLAND AVE @ BENTON RD	0.3		0.3		13.9	0.2		0.2		17.2	0.2		0.4		18
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	3.5		0.8		16.6	3		1		19.2	1.8		0.8		19
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.3		0		16.9	0.2		0.6		18.8	1.6		0.6		20
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0.5		0.3		17.1	1.4		1.8		18.4	1		1.6		19.4
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.5		0		17.6	0.2		0.4		18.2	0.2		0		19.6
15 - 2687 - HIGHLAND AVE @ WALNUT ST	0.8		0.8		17.6	2		2.2		18	1.2		1		19.8
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0		0.3		17.3	0		0		18	0		0.6		19.2
17 - 2689 - 422 MCGRATH HWY	0.5		0		17.8	0.2		0.2		18	0		0.2		19
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.5		1.3		17	1.3		0.5		18.8	0.8		1.3		18.5
19 - 2392 - CROSS ST @ ALSTON ST	0		0		17	0		0		18.8	0.3		1		17.8
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.3		1.5		15.8	0		0.5		18.3	0.3		0		18.1
21 - 2393 - CROSS ST @ OLIVER ST	0.5		0.8		15.5	0.6		0.2		18.7	0.5		0.3		18.3
22 - 2745 - CROSS ST @ PEARL ST	0.3		0		15.8	0.4		0.2		18.9	0.6		1		17.9
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0.5		15.3	0		0		18.9	0.2		0.2		17.9
24 - 2747 - CROSS ST @ BROADWAY	0.5		1.3		14.5	0		0.8		18.1	0.6		0.6		17.9
25 - 2711 - BROADWAY @ GLEN ST	0		0.5		14	0		0.2		17.9	0		0.4		17.5
26 - 2712 - BROADWAY @ FRANKLIN ST	1		0.3		14.7	1.2		3		16.1	0.2		1.2		16.5
27 - 2713 - BROADWAY @ LINCOLN ST	1.3		0		16	0		0		16.1	0.2		0.4		16.3
28 - 2714 - BROADWAY @ MT VERNON ST	0		0		16	0		0		16.1	0		0.2		16.1
29 - 2874 - SULLIVAN STATION - UPPER BUSW	1.8		8		9.8	5		7.2		13.9	4.6		7		13.7
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		9.8	0		0		13.9	0		0		13.7
31 - 2717 - MAIN ST @ DORRANCE ST	0.7		0		10.5	0		0		13.9	0.2		0		13.9
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		0.3		10.2	0		0.6		13.3	0		1.2		12.7
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	2.8		4.5		8.5	5.2		8.6		9.9	4.2		3.2		13.7
34 - 5271 - WELLINGTON STATION BUSWAY	0		8.8	1	-9.8	0		8.6	1	-9.6	0		13	1	-14
Maximum					17.8					19.2					20
Total	29.7		31			37.7		37.4			38.2		38.5		

Massachusetts Bay Transportation Authority
Route 90
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Fall 2012
(Urban Transportation Associates)

	17:55 (90 .0) [3] !Fall 2012!					19:05 (90 .0) [3] !Fall 2012!					20:15 (90 .0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 5104 - DAVIS SQUARE BUSWAY	8	2	0		10	9	1	0		10	9.3	1	0		10.3
2 - 2582 - ELM ST @ CHESTER ST	3.3		0		13.3	6.3		0		16.3	2.7		0		13
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	1.7		0		15	1		0.3		17	0		0		13
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	0.3		0		15.3	0.7		0.3		17.4	0.3		0		13.3
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.7		0		16	0		0		17.4	0		0		13.3
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.3		0.7		15.6	0.7		0.3		17.8	0.7		0.3		13.7
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		15.6	0.7		0.3		18.2	0		0		13.7
8 - 2679 - HIGHLAND AVE @ TOWER ST.	0		0.3		15.3	0.3		0		18.5	0.3		0		14
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0		0		15.3	0		1.3		17.2	0		1.7		12.3
10 - 2681 - HIGHLAND AVE @ BENTON RD	0		0		15.3	0.3		0.7		16.8	0		0.7		11.6
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1.7		1		16	1.7		1.3		17.2	0.7		0.3		12
12 - 2683 - HIGHLAND AVE @ TRULL LN	0		0.3		15.7	0		0		17.2	0		1.7		10.3
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0.7		2		14.4	0.7		0.3		17.6	0		3		7.3
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0.3		0		14.7	0		0.3		17.3	0.3		0		7.6
15 - 2687 - HIGHLAND AVE @ WALNUT ST	0.3		0.7		14.3	0		0.7		16.6	0.3		0.7		7.2
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	1		0.3		15	0		0.3		16.3	0		0		7.2
17 - 2689 - 422 MCGRATH HWY	0		0.3		14.7	0.3		0		16.6	0		0		7.2
18 - 2659 - MCGRATH HWY @ ALSTON ST	0.7		0.3		15.1	0.3		0.3		16.6	0		0		7.2
19 - 2392 - CROSS ST @ ALSTON ST	0		0		15.1	0		0		16.6	0		0		7.2
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0.3		0		15.4	0		0		16.6	0		0		7.2
21 - 2393 - CROSS ST @ OLIVER ST	0		0		15.4	0		0.3		16.3	0		0.3		6.9
22 - 2745 - CROSS ST @ PEARL ST	0.7		0.7		15.4	0		2		14.3	0.3		1		6.2
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0.3		15.1	0		0.3		14	0		0		6.2
24 - 2747 - CROSS ST @ BROADWAY	0		0.3		14.8	0.7		1		13.7	0.7		0.3		6.6
25 - 2711 - BROADWAY @ GLEN ST	1.3		3.7		12.4	0		0		13.7	0		0.7		5.9
26 - 2712 - BROADWAY @ FRANKLIN ST	0		1.3		11.1	0.7		0		14.4	0		0		5.9
27 - 2713 - BROADWAY @ LINCOLN ST	0		1.3		9.8	1		1.3		14.1	0.3		0.3		5.9
28 - 2714 - BROADWAY @ MT VERNON ST	0.3		0		10.1	0		0.3		13.8	0		0		5.9
29 - 2874 - SULLIVAN STATION - UPPER BUSW	0.3		5.7		4.7	0.3		5.3		8.8	0.7		2.3		4.3
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		4.7	0		0		8.8	0		0		4.3
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		4.7	0		0		8.8	0		0		4.3
32 - 28742 - STURTEVANT ST @ FOLEY ST	0.3		0		5	0.3		1		8.1	0		0		4.3
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	5.7		1.7		9	3		0.7		10.4	4.7		0.7		8.3
34 - 5271 - WELLINGTON STATION BUSWAY	0		8.7	2	-10.7	0		9.3	1	-10.3	0		5.7	1	-6.7
Maximum					16					18.5					14
Total	28		29.7			28		28.3			21.3		19.7		

Massachusetts Bay Transportation Authority
Route 90
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	21:25 (90 .0) [3] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 5104 - DAVIS SQUARE BUSWAY	11	1	0		12	86	0	99
2 - 2582 - ELM ST @ CHESTER ST	1		0		13	46.5	2.1	143.4
3 - 2674 - HIGHLAND AVE @ CUTTER AVE	0		0		13	6.3	0.3	149.4
4 - 2675 - HIGHLAND AVE @ WILLOW AVE	1.3		0		14.3	6.2	0.3	155.3
5 - 2676 - HIGHLAND AVE @ CHERRY ST	0.3		0		14.6	4.9	0.8	159.4
6 - 2677 - HIGHLAND AVE @ CEDAR ST	0.3		0		14.9	8.9	2.8	165.5
7 - 2678 - HIGHLAND AVE @ CONWELL ST	0		0		14.9	0.9	0.7	165.7
8 - 2679 - HIGHLAND AVE @ TOWER ST.	0		0		14.9	7.2	2.1	170.8
9 - 2680 - HIGHLAND AVE @ LOWELL ST	0		0.7		14.2	6.3	5.9	171.2
10 - 2681 - HIGHLAND AVE @ BENTON RD	0		0.7		13.5	2.3	4.1	169.4
11 - 2682 - HIGHLAND AVE @ CENTRAL ST	1		1.3		13.2	21.6	8.5	182.5
12 - 2683 - HIGHLAND AVE @ TRULL LN	0.3		1		12.5	3.2	5.5	180.2
13 - 2684 - HIGHLAND AVE @ SCHOOL ST	0		0		12.5	9.1	14.1	175.2
14 - 2686 - HIGHLAND AVE @ VINAL AVE	0		0		12.5	3.1	1	177.3
15 - 2687 - HIGHLAND AVE @ WALNUT ST	0		1		11.5	13.3	11.7	178.9
16 - 2688 - MEDFORD ST @ HIGHLAND AVE	0		0		11.5	2.6	3.6	177.9
17 - 2689 - 422 MCGRATH HWY	0		0		11.5	2.3	1.5	178.7
18 - 2659 - MCGRATH HWY @ ALSTON ST	0		1		10.5	5.9	7	177.6
19 - 2392 - CROSS ST @ ALSTON ST	0		1		9.5	0.6	2.3	175.9
20 - 23921 - CROSS ST @ FOUNTAIN AVE	0		0		9.5	3.6	3.3	176.2
21 - 2393 - CROSS ST @ OLIVER ST	0		0		9.5	4.7	2.8	178.1
22 - 2745 - CROSS ST @ PEARL ST	0		1		8.5	6.2	7	177.3
23 - 2746 - CROSS ST @ ELLSWORTH ST	0		0		8.5	0.8	2.7	175.4
24 - 2747 - CROSS ST @ BROADWAY	0		0.3		8.2	5.1	7.4	173.1
25 - 2711 - BROADWAY @ GLEN ST	0		0.3		7.9	3.5	7.7	168.9
26 - 2712 - BROADWAY @ FRANKLIN ST	0		0.7		7.2	9	12.3	165.6
27 - 2713 - BROADWAY @ LINCOLN ST	0		0.3		6.9	3.8	4.7	164.7
28 - 2714 - BROADWAY @ MT VERNON ST	0		0.7		6.2	1.1	4.1	161.7
29 - 2874 - SULLIVAN STATION - UPPER BUSW	0		2.3		3.9	26.6	79.7	108.6
30 - 28740 - NOT A STOP FOR ITINERARY	0		0		3.9	0	0	108.6
31 - 2717 - MAIN ST @ DORRANCE ST	0		0		3.9	0.9	0	109.5
32 - 28742 - STURTEVANT ST @ FOLEY ST	0		0		3.9	0.6	7.8	102.3
33 - 42879 - ASSEMBLY SQ MALL OPP BED BATH	1.7		0		5.6	33.9	43.6	92.6
34 - 5271 - WELLINGTON STATION BUSWAY	0		3.7	1	-4.7	0	84.3	-97.3
Maximum					14.9	0	0	206.6
Total	17		16			333.6	338.7	0

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	05:02 (100.3) [14] !Fall 2012!					05:30 (100.3) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1.2	0	0		1.2	1.3	0	0		1.3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		1.2	0.1		0		1.4
1200 - 8304 - FELLSWAY W @ FULTON ST	2.5		0.1		3.6	3.1		0.4		4.1
1600 - 48304 - FELLSWAY W @ PARK ST	1.3		0		4.9	0		0		4.1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.8		0		5.7	0.3		0		4.4
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.4		0		6.1	0.1		0		4.5
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.5		0		6.6	0.9		0		5.4
3200 - 5264 - FELLSWAY W @ SALEM ST	2.9		0		9.5	2.1		0.1		7.4
3600 - 5265 - 1250 FELLSWAY	0.2		0		9.7	1.9		0		9.3
4000 - 5266 - FELLSWAY @ EMERALD ST	1.4		0		11.1	0		0		9.3
4400 - 5268 - FELLSWAY @ MALDEN ST	3.1		0		14.2	0.5		0		9.8
4800 - 5267 - FELLSWAY @ CENTRAL AVE	2.5		0		16.7	2.2		0		12
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.6		0		18.3	1.9		0		13.9
5600 - 5270 - FELLSWAY @ SECOND ST	1.1		0		19.4	0.4		0		14.3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.1		0.1		20.4	0.7		0.3		14.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.1		1		19.5	0		0		14.7
6800 - 5271 - WELLINGTON STATION BUSWAY	0		19.6	0	-0.1	0		14.6	0	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					20.4					14.7
Total	20.7		20.7			15.4		15.4		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	06:00 (100.3) [14] !Fall 2012!					06:20 (100.3) [9] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2.1	0	0		2.1	0.8	0	0		0.8
800 - 8303 - FELLSWAY W @ S BORDER RD	0.3		0		2.4	0.7		0		1.5
1200 - 8304 - FELLSWAY W @ FULTON ST	2.5		0.5		4.4	1.9		0		3.4
1600 - 48304 - FELLSWAY W @ PARK ST	1.1		0		5.5	0.7		0		4.1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.5		0		6	0		0		4.1
2400 - 8306 - FELLSWAY W @ CHERRY ST	2		0		8	0		0		4.1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.6		0		8.6	0.3		0		4.4
3200 - 5264 - FELLSWAY W @ SALEM ST	1.1		0.1		9.6	1.4		0		5.8
3600 - 5265 - 1250 FELLSWAY	1.6		0		11.2	0.8		0		6.6
4000 - 5266 - FELLSWAY @ EMERALD ST	0.1		0		11.3	0.2		0		6.8
4400 - 5268 - FELLSWAY @ MALDEN ST	1.9		0		13.2	0.7		0		7.5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	5		0		18.2	2.9		0		10.4
5200 - 5269 - FELLSWAY @ MYRTLE ST	3		0		21.2	2.9		0.1		13.2
5600 - 5270 - FELLSWAY @ SECOND ST	0.8		0		22	0.6		0		13.8
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.4		0.3		23.1	0		0		13.8
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.1		0.8		22.4	0.4		0.2		14
6800 - 5271 - WELLINGTON STATION BUSWAY	0		22.4	0	0	0		13.9	0	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					23.1					14
Total	24		24			14.2		14.2		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	06:40 (100.3) [10] !Fall 2012!					07:00 (100.3) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2.2	0	0		2.2	2.4	0	0		2.4
800 - 8303 - FELLSWAY W @ S BORDER RD	0.1		0		2.3	1.2		0		3.6
1200 - 8304 - FELLSWAY W @ FULTON ST	3		0		5.3	3.3		0		6.9
1600 - 48304 - FELLSWAY W @ PARK ST	0.1		0		5.4	0		0		6.9
2000 - 8305 - FELLSWAY W @ PARIS ST	0.7		0		6.1	0.8		0		7.7
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.2		0		6.3	0.2		0		7.9
2800 - 8307 - FELLSWAY W @ GRANT AVE	1.4		0		7.7	1.8		0		9.7
3200 - 5264 - FELLSWAY W @ SALEM ST	3.5		0.7		10.5	3		0.1		12.6
3600 - 5265 - 1250 FELLSWAY	1.6		0		12.1	1.5		0.1		14
4000 - 5266 - FELLSWAY @ EMERALD ST	0.4		0		12.5	3.8		0		17.8
4400 - 5268 - FELLSWAY @ MALDEN ST	3		0		15.5	1.6		0		19.4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	4.7		0		20.2	3.4		0		22.8
5200 - 5269 - FELLSWAY @ MYRTLE ST	4.8		0		25	4.3		0.1		27
5600 - 5270 - FELLSWAY @ SECOND ST	1.5		0		26.5	2.2		0.3		28.9
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.8		1		26.3	2.1		0.4		30.6
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.2		0		26.5	0.4		0		31
6800 - 5271 - WELLINGTON STATION BUSWAY	0		26.5	0	3.6E-15	0		31.8	0	-0.8
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					26.5					31
Total	28.2		28.2			32		32.8		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	07:20 (100.3) [10] !Fall 2012!					07:40 (100.3) [11] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.8	1	0		1.8	0.6	0	0		0.6
800 - 8303 - FELLSWAY W @ S BORDER RD	2.2		0		4	1.5		0.2		1.9
1200 - 8304 - FELLSWAY W @ FULTON ST	3.7		0		7.7	7.2		0		9.1
1600 - 48304 - FELLSWAY W @ PARK ST	0.4		0		8.1	0.3		0		9.4
2000 - 8305 - FELLSWAY W @ PARIS ST	3.2		0		11.3	0.5		0		9.9
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.2		0		11.5	0.2		0		10.1
2800 - 8307 - FELLSWAY W @ GRANT AVE	1		0		12.5	1		0.1		11
3200 - 5264 - FELLSWAY W @ SALEM ST	2.8		0		15.3	3.5		0.1		14.4
3600 - 5265 - 1250 FELLSWAY	0.1		0		15.4	1.2		0		15.6
4000 - 5266 - FELLSWAY @ EMERALD ST	2.3		0.1		17.6	1.2		0		16.8
4400 - 5268 - FELLSWAY @ MALDEN ST	2.3		0		19.9	1.7		0		18.5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	6.5		0.3		26.1	7.2		0.2		25.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	5.3		0		31.4	5.2		0.3		30.4
5600 - 5270 - FELLSWAY @ SECOND ST	1.9		0		33.3	0.6		0		31
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		34.3	2.4		0.4		33
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0.6		34	0.5		0.2		33.3
6800 - 5271 - WELLINGTON STATION BUSWAY	0		33	1	-7.1E-15	0		33.3	0	0
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					34.3					33.3
Total	34		34			34.6		34.6		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	08:00 (100.3) [5] !Fall 2012!					08:20 (100.3) [5] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	0	0		1	0.2	0	0		0.2
800 - 8303 - FELLSWAY W @ S BORDER RD	2.8		0		3.8	2		0		2.2
1200 - 8304 - FELLSWAY W @ FULTON ST	2		0		5.8	2.6		0		4.8
1600 - 48304 - FELLSWAY W @ PARK ST	0.4		0		6.2	1.6		0		6.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0.2		0		6.4	0.2		0		6.6
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.2		0		6.6	0		0		6.6
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.4		0		7	0.8		0		7.4
3200 - 5264 - FELLSWAY W @ SALEM ST	2		0		9	2.4		0		9.8
3600 - 5265 - 1250 FELLSWAY	0.8		0		9.8	1.4		0		11.2
4000 - 5266 - FELLSWAY @ EMERALD ST	1.6		0		11.4	1.2		0		12.4
4400 - 5268 - FELLSWAY @ MALDEN ST	0.6		0		12	0.8		0		13.2
4800 - 5267 - FELLSWAY @ CENTRAL AVE	3.8		0		15.8	2.6		0.6		15.2
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.2		0		17	1.6		0.4		16.4
5600 - 5270 - FELLSWAY @ SECOND ST	0.8		0		17.8	0.4		0		16.8
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.8		0.4		19.2	2.4		0.6		18.6
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	2.2		0.2		21.2	0.2		0.2		18.6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		21.2	0	3.6E-15	0		18.6	0	-3.6E-15
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					21.2					18.6
Total	21.8		21.8			20.4		20.4		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	08:55 (100.3) [11] !Fall 2012!					09:30 (100.3) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	1	0		2	0.6	1	0		1.6
800 - 8303 - FELLSWAY W @ S BORDER RD	1		0		3	2		0		3.6
1200 - 8304 - FELLSWAY W @ FULTON ST	2.4		0		5.4	1.9		0		5.5
1600 - 48304 - FELLSWAY W @ PARK ST	0.8		0		6.2	0.6		0		6.1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.6		0		6.8	0.7		0		6.8
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.3		0		7.1	0.2		0		7
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.5		0		7.6	0.9		0		7.9
3200 - 5264 - FELLSWAY W @ SALEM ST	2.9		0		10.5	2.3		0.3		9.9
3600 - 5265 - 1250 FELLSWAY	1		0		11.5	0.5		0		10.4
4000 - 5266 - FELLSWAY @ EMERALD ST	1		0		12.5	0.5		0		10.9
4400 - 5268 - FELLSWAY @ MALDEN ST	0.6		0		13.1	0.7		0		11.6
4800 - 5267 - FELLSWAY @ CENTRAL AVE	2.1		0		15.2	0.9		0		12.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	7		0.1		22.1	2		0.1		14.4
5600 - 5270 - FELLSWAY @ SECOND ST	0.5		0.2		22.4	0.1		0		14.5
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.1		0.5		23	0.8		0.6		14.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.4		0.9		23.5	1.1		0.3		15.5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		22.5	1	0	0		14.5	1	-1.8E-15
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					23.5					15.5
Total	24.3		24.3			15.8		15.8		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	10:05 (100.3) [7] !Fall 2012!					10:40 (100.3) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1.1	1	0		2.1	1.1	1	0		2.1
800 - 8303 - FELLSWAY W @ S BORDER RD	1.3		0.4		3	0.9		0.3		2.7
1200 - 8304 - FELLSWAY W @ FULTON ST	2.7		0		5.7	1.5		0		4.2
1600 - 48304 - FELLSWAY W @ PARK ST	1.1		0		6.8	0.9		0		5.1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.3		0		7.1	2		0		7.1
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.4		0		7.5	0		0		7.1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.3		0		7.8	0.4		0.1		7.4
3200 - 5264 - FELLSWAY W @ SALEM ST	1.4		0.1		9.1	1.1		0.1		8.4
3600 - 5265 - 1250 FELLSWAY	0.4		0.1		9.4	1.1		0		9.5
4000 - 5266 - FELLSWAY @ EMERALD ST	0.3		0		9.7	1		0		10.5
4400 - 5268 - FELLSWAY @ MALDEN ST	0.7		0		10.4	0.3		0		10.8
4800 - 5267 - FELLSWAY @ CENTRAL AVE	2.1		0.1		12.4	1.6		0.1		12.3
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.9		0		14.3	1.8		0.1		14
5600 - 5270 - FELLSWAY @ SECOND ST	0.1		0		14.4	0.6		0		14.6
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.1		0.6		14.9	0.6		0.9		14.3
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.1		0.6		15.4	1		0.5		14.8
6800 - 5271 - WELLINGTON STATION BUSWAY	0		14.6	1	-0.2	0		13.8	1	1.8E-15
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					15.4					14.8
Total	16.6		16.6			15.9		15.9		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	11:15 (100.3) [8] !Fall 2012!					11:50 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.9	1	0		1.9	0.8	1	0		1.8
800 - 8303 - FELLSWAY W @ S BORDER RD	1.5		0		3.4	1.1		0.1		2.8
1200 - 8304 - FELLSWAY W @ FULTON ST	1.3		0		4.7	2.3		0		5.1
1600 - 48304 - FELLSWAY W @ PARK ST	0.5		0		5.2	0.5		0		5.6
2000 - 8305 - FELLSWAY W @ PARIS ST	0.4		0		5.6	0		0		5.6
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.1		0.1		5.6	0.1		0		5.7
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.9		0		6.5	0.1		0		5.8
3200 - 5264 - FELLSWAY W @ SALEM ST	1.4		0.6		7.3	2.1		0.3		7.6
3600 - 5265 - 1250 FELLSWAY	0.9		0		8.2	0		0		7.6
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		8.2	0.5		0		8.1
4400 - 5268 - FELLSWAY @ MALDEN ST	0.6		0		8.8	0.3		0		8.4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.5		0.1		9.2	0.8		0		9.2
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.6		0		9.8	2.1		0.4		10.9
5600 - 5270 - FELLSWAY @ SECOND ST	0.3		0.1		10	1.1		0		12
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.3		0.3		10	0.5		0.8		11.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.8		9.2	0.8		0.6		11.9
6800 - 5271 - WELLINGTON STATION BUSWAY	0		8.1	1	0.1	0		10.9	1	-1.8E-15
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					10					12
Total	10		10.1			13		13		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	12:25 (100.3) [8] !Fall 2012!					13:00 (100.3) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	2	0		3	1.1	1	0		2.1
800 - 8303 - FELLSWAY W @ S BORDER RD	0.8		0		3.8	0.7		0		2.8
1200 - 8304 - FELLSWAY W @ FULTON ST	1.3		0		5.1	0.7		0		3.5
1600 - 48304 - FELLSWAY W @ PARK ST	0.4		0		5.5	0		0.1		3.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0.5		0		6	0.4		0		3.8
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		6	0.7		0		4.5
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.1		0		6.1	0.2		0		4.7
3200 - 5264 - FELLSWAY W @ SALEM ST	1.1		0.3		6.9	2.4		0.2		6.9
3600 - 5265 - 1250 FELLSWAY	0.5		0.1		7.3	0		0		6.9
4000 - 5266 - FELLSWAY @ EMERALD ST	0.4		0		7.7	0.6		0		7.5
4400 - 5268 - FELLSWAY @ MALDEN ST	0.1		0		7.8	0		0		7.5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.9		0		8.7	0.8		0		8.3
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.1		0		9.8	1.5		0		9.8
5600 - 5270 - FELLSWAY @ SECOND ST	0.1		0.1		9.8	0.5		0		10.3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.8		0.8		9.8	0.6		0.5		10.4
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.5		0.4		9.9	1		0.1		11.3
6800 - 5271 - WELLINGTON STATION BUSWAY	0		8	2	-0.1	0		10.5	1	-0.2
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					9.9					11.3
Total	9.5		9.6			11.2		11.4		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]									
	13:35 (100.3) [12] !Fall 2012!					14:10 (100.3) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.8	1	0		1.8	0.8	2	0		2.8
800 - 8303 - FELLSWAY W @ S BORDER RD	0.6		0.1		2.3	0.1		0		2.9
1200 - 8304 - FELLSWAY W @ FULTON ST	1.6		0		3.9	0.6		0		3.5
1600 - 48304 - FELLSWAY W @ PARK ST	0.6		0		4.5	0.4		0		3.9
2000 - 8305 - FELLSWAY W @ PARIS ST	0.4		0		4.9	0.3		0		4.2
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.1		0		5	0.3		0		4.5
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.6		0		5.6	1.4		0		5.9
3200 - 5264 - FELLSWAY W @ SALEM ST	3.1		0.3		8.4	1.1		0		7
3600 - 5265 - 1250 FELLSWAY	0.2		0		8.6	1		0		8
4000 - 5266 - FELLSWAY @ EMERALD ST	0.6		0.1		9.1	0.1		0		8.1
4400 - 5268 - FELLSWAY @ MALDEN ST	0.1		0		9.2	0		0		8.1
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.6		0		9.8	0.6		0		8.7
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.8		0.1		11.5	0.9		0		9.6
5600 - 5270 - FELLSWAY @ SECOND ST	0.1		0		11.6	1.1		0		10.7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.3		0.8		12.1	1.1		0.6		11.2
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.7		0.3		12.5	0.7		0.4		11.5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		11.5	1	-3.6E-15	0		9.7	2	-0.2
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					12.5					11.5
Total	13		13			10.6		10.7		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	14:45 (100.3) [7] !Fall 2012!					15:20 (100.3) [7] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.9	1	0		1.9	1.3	1	0		2.3
800 - 8303 - FELLSWAY W @ S BORDER RD	0.1		0.4		1.6	0		0.1		2.2
1200 - 8304 - FELLSWAY W @ FULTON ST	2		0		3.6	1.9		0		4.1
1600 - 48304 - FELLSWAY W @ PARK ST	2.3		0		5.9	0.1		0		4.2
2000 - 8305 - FELLSWAY W @ PARIS ST	0.3		0		6.2	0.1		0		4.3
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.3		0		6.5	0.6		0		4.9
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.1		0		6.6	0.3		0		5.2
3200 - 5264 - FELLSWAY W @ SALEM ST	1.3		0		7.9	2		0.1		7.1
3600 - 5265 - 1250 FELLSWAY	0		0		7.9	0.1		0		7.2
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		7.9	0		0		7.2
4400 - 5268 - FELLSWAY @ MALDEN ST	0.1		0		8	0.1		0		7.3
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.1		0		8.1	0.6		0		7.9
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.9		0		9	1.6		0.1		9.4
5600 - 5270 - FELLSWAY @ SECOND ST	0.1		1.1		8	0.1		0.3		9.2
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0.4		7.6	0.6		0.7		9.1
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0.3		7.6	0.1		0.3		8.9
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6.7	1	-0.1	0		8	1	-0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					9					9.4
Total	8.9		9			9.6		9.7		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	15:55 (100.3) [13] !Fall 2012!					16:40 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.5	2	0		2.5	0	0	0		0
800 - 8303 - FELLSWAY W @ S BORDER RD	0.5		0.5		2.5	0		1		-1
1200 - 8304 - FELLSWAY W @ FULTON ST	1.4		0.1		3.8	0		0		-1
1600 - 48304 - FELLSWAY W @ PARK ST	0.6		0		4.4	2		0		1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.5		0		4.9	0		0		1
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.2		0		5.1	0		0		1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.8		0		5.9	0		0		1
3200 - 5264 - FELLSWAY W @ SALEM ST	2.2		0.2		7.9	2		0		3
3600 - 5265 - 1250 FELLSWAY	0.8		0		8.7	1		0		4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		8.7	0		0		4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		8.7	0		0		4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.7		0.2		9.2	3		0		7
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.4		0		10.6	3		0		10
5600 - 5270 - FELLSWAY @ SECOND ST	0.4		0.1		10.9	0		0		10
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	2.8		0.8		12.9	0		3		7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.4		0.9		13.4	0		2		5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		11.5	2	-0.1	0		5	0	0
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					13.4					10
Total	14.1		14.2			11		11		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	17:00 (100.3) [7] !Fall 2012!					17:20 (100.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.3	0	0		0.3	0.7	0	0		0.7
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0.6		-0.3	0		0		0.7
1200 - 8304 - FELLSWAY W @ FULTON ST	0.7		0		0.4	0.7		0		1.4
1600 - 48304 - FELLSWAY W @ PARK ST	0.6		0		1	0.7		0		2.1
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		1	0		0		2.1
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		1	0		0		2.1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.4		0		1.4	0.7		0		2.8
3200 - 5264 - FELLSWAY W @ SALEM ST	0.4		0		1.8	0.3		0		3.1
3600 - 5265 - 1250 FELLSWAY	0.4		0		2.2	0		0		3.1
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		2.2	0.7		0		3.8
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		2.2	0		0		3.8
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.1		0.4		1.9	0		0		3.8
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0		2.2	1.3		0.7		4.4
5600 - 5270 - FELLSWAY @ SECOND ST	0.4		0		2.6	0.7		0		5.1
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	3		0		5.6	1.7		0.3		6.5
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.6		0.3		5.9	0.3		0		6.8
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6	0	-0.1	0		6.7	0	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					5.9					6.8
Total	7.3		7.3			7.7		7.7		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	17:40 (100.3) [13] !Fall 2012!					18:00 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.8	0	0		0.8	0.4	1	0		1.4
800 - 8303 - FELLSWAY W @ S BORDER RD	0.4		0.2		1	0		1.3		0.1
1200 - 8304 - FELLSWAY W @ FULTON ST	0.6		0		1.6	0		0		0.1
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		1.6	0.9		0		1
2000 - 8305 - FELLSWAY W @ PARIS ST	0.2		0		1.8	0.8		0		1.8
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		1.8	0		0		1.8
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.3		0		2.1	0		0		1.8
3200 - 5264 - FELLSWAY W @ SALEM ST	0.2		0.4		1.9	0.8		0		2.6
3600 - 5265 - 1250 FELLSWAY	0.2		0		2.1	0		0		2.6
4000 - 5266 - FELLSWAY @ EMERALD ST	0.1		0		2.2	0		0		2.6
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		2.2	0		0		2.6
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.4		0.2		2.4	0		0.1		2.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0.1		2.6	1.3		0.1		3.7
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		2.6	0.5		0		4.2
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.7		0.1		3.2	1.6		0.4		5.4
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0.3		3.2	0.5		0		5.9
6800 - 5271 - WELLINGTON STATION BUSWAY	0		3.2	0	-4.4E-16	0		4.8	1	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					3.2					5.9
Total	4.5		4.5			6.6		6.6		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	18:20 (100.3) [13] !Fall 2012!					18:40 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	1	0		2	0.5	0	0		0.5
800 - 8303 - FELLSWAY W @ S BORDER RD	0.4		0.8		1.6	0		0.8		-0.3
1200 - 8304 - FELLSWAY W @ FULTON ST	0.3		0		1.9	0.5		0		0.2
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		1.9	0		0		0.2
2000 - 8305 - FELLSWAY W @ PARIS ST	0.2		0		2.1	0.1		0		0.3
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.1		0		2.2	0		0		0.3
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		2.2	0.3		0		0.6
3200 - 5264 - FELLSWAY W @ SALEM ST	0.7		0		2.9	0.4		0.4		0.6
3600 - 5265 - 1250 FELLSWAY	0.1		0		3	0.3		0		0.9
4000 - 5266 - FELLSWAY @ EMERALD ST	0.1		0		3.1	0		0		0.9
4400 - 5268 - FELLSWAY @ MALDEN ST	0.1		0		3.2	0.3		0		1.2
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		3.2	0.9		0.1		2
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.2		0		3.4	0.3		0		2.3
5600 - 5270 - FELLSWAY @ SECOND ST	0		0.1		3.3	0		0		2.3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0.3		4	1		0.1		3.2
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.6		0.3		4.3	0.8		0.4		3.6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		3.2	1	0.1	0		3.4	0	0.2
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					4.3					3.6
Total	4.6		4.6			5.1		5.1		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	18:54 (100.0) [4] !Fall 2012!					19:20 (100.3) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.3	0	0		0.3	0.4	2	0		2.4
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		0.3	0		0.4		2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		0.3	1.3		0		3.3
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		0.3	0.1		0		3.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		0.3	0		0		3.4
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		0.3	0		0		3.4
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		0.3	0.4		0		3.8
3200 - 5264 - FELLSWAY W @ SALEM ST					0.3	1.1		0		4.9
3600 - 5265 - 1250 FELLSWAY					0.3	1		0		5.9
4000 - 5266 - FELLSWAY @ EMERALD ST					0.3	0		0		5.9
4400 - 5268 - FELLSWAY @ MALDEN ST					0.3	0		0		5.9
4800 - 5267 - FELLSWAY @ CENTRAL AVE					0.3	0.4		0.3		6
5200 - 5269 - FELLSWAY @ MYRTLE ST					0.3	0.4		0.1		6.3
5600 - 5270 - FELLSWAY @ SECOND ST					0.3	0		0		6.3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE					0.3	1.5		0		7.8
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE					0.3	0.3		0.1		8
6800 - 5271 - WELLINGTON STATION BUSWAY					0.3	0		5.9	2	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	0		0.3		0	.		.		.
Maximum					0.3					8
Total	0.3		0.3			6.8		6.8		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	19:50 (100.3) [8] !Fall 2012!					20:45 (100.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1.3	1	0		2.3	0.4	2	0		2.4
800 - 8303 - FELLSWAY W @ S BORDER RD	0.1		0		2.4	0.3		0.6		2.1
1200 - 8304 - FELLSWAY W @ FULTON ST	0.3		0.1		2.6	1.3		0		3.4
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		2.6	0		0		3.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		2.6	0		0		3.4
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		2.6	0		0		3.4
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0.1		2.5	0.2		0		3.6
3200 - 5264 - FELLSWAY W @ SALEM ST	1.1		0		3.6	0.7		0.3		4
3600 - 5265 - 1250 FELLSWAY	0		0		3.6	0.3		0		4.3
4000 - 5266 - FELLSWAY @ EMERALD ST	0.1		0		3.7	0		0		4.3
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		3.7	0		0		4.3
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.4		0.1		4	0.3		0.1		4.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0.1		4.2	0.2		0		4.7
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		4.2	0		0		4.7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.1		0		4.3	1.5		0.1		6.1
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.4		3.9	0.6		0		6.7
6800 - 5271 - WELLINGTON STATION BUSWAY	0		2.8	1	0.1	0		4.7	2	0
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					4.3					6.7
Total	3.6		3.6			5.7		5.7		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	21:45 (100.3) [11] !Fall 2012!					22:45 (100.3) [12] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.3	3	0		3.3	0.6	2	0		2.6
800 - 8303 - FELLSWAY W @ S BORDER RD	0.2		0.1		3.4	0		0.1		2.5
1200 - 8304 - FELLSWAY W @ FULTON ST	0.2		0		3.6	0		0		2.5
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3.6	0.2		0.1		2.6
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3.6	0.2		0		2.8
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3.6	0		0		2.8
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.8		0		4.4	0		0		2.8
3200 - 5264 - FELLSWAY W @ SALEM ST	0.5		0		4.9	0.3		0		3.1
3600 - 5265 - 1250 FELLSWAY	0.1		0		5	0		0		3.1
4000 - 5266 - FELLSWAY @ EMERALD ST	0.1		0		5.1	0		0		3.1
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		5.1	0		0		3.1
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.1		0.2		5	0		0		3.1
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		5	0.1		0		3.2
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		5	0		0		3.2
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		6	0.3		0.1		3.4
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.7		0.1		6.6	0.6		0		4
6800 - 5271 - WELLINGTON STATION BUSWAY	0		3.6	3	0	0		1.9	2	0.1
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					6.6					4
Total	4		4			2.2		2.2		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	23:45 (100.3) [12] !Fall 2012!					24:45 (100.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.5	2	0		2.5	1	2	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	0.3		0		2.8	0.2		0		3.2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		2.8	0		0.2		3
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		2.8	0		0		3
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		2.8	0		0		3
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		2.8	0		0		3
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		2.8	0		0		3
3200 - 5264 - FELLSWAY W @ SALEM ST	0.2		0		3	0		0		3
3600 - 5265 - 1250 FELLSWAY	0.1		0		3.1	0		0		3
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3.1	0		0		3
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		3.1	0		0		3
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.2		0		3.3	0		0		3
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0.1		3.2	0		0		3
5600 - 5270 - FELLSWAY @ SECOND ST	0		0.1		3.1	0		0		3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.1		0		3.2	0		0		3
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.1		3.1	0.1		0.1		3
6800 - 5271 - WELLINGTON STATION BUSWAY	0		1	2	0.1	0		1	2	0
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	.		.		.	.		.		.
Maximum					3.3					3.2
Total	1.3		1.3			1.3		1.3		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Total		
Seq - StopID - Stop Name	On	Off	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	33	0	66
800 - 8303 - FELLSWAY W @ S BORDER RD	23.4	8	81.4
1200 - 8304 - FELLSWAY W @ FULTON ST	59.3	1.4	139.3
1600 - 48304 - FELLSWAY W @ PARK ST	19.2	0.2	158.3
2000 - 8305 - FELLSWAY W @ PARIS ST	15.2	0	173.5
2400 - 8306 - FELLSWAY W @ CHERRY ST	6.9	0.1	180.3
2800 - 8307 - FELLSWAY W @ GRANT AVE	18.4	0.3	198.4
3200 - 5264 - FELLSWAY W @ SALEM ST	57.8	4.7	251.5
3600 - 5265 - 1250 FELLSWAY	21.1	0.3	272.3
4000 - 5266 - FELLSWAY @ EMERALD ST	18.3	0.2	290.4
4400 - 5268 - FELLSWAY @ MALDEN ST	20.2	0	310.6
4800 - 5267 - FELLSWAY @ CENTRAL AVE	58.9	3.1	366.4
5200 - 5269 - FELLSWAY @ MYRTLE ST	64.1	3	427.5
5600 - 5270 - FELLSWAY @ SECOND ST	17	2.4	442.1
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	38.8	16.2	464.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	19.9	13.7	470.9
6800 - 5271 - WELLINGTON STATION BUSWAY	0	438.4	-0.5
6840 - 5333 - SALEM ST @ FELLSWAY GARAGE	0	0.3	0
Maximum	0	0	481.4
Total	489.8	491.4	0

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	05:15 (100.3) [14] !Fall 2012!					05:45 (100.3) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On		Off		Load
400 - 5271 - WELLINGTON STATION BUSWAY	1.5	0	0		1.5	3.6	0	0		3.6
800 - 9318 - CORPORATION WAY AFTER BRIDGE	1.2		0.1		2.6	0		0		3.6
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		1.1		1.5	0.1		0.4		3.3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		1.5	0		0		3.3
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		0		1.5	0		2.4		0.9
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.6		0.9	0		0.1		0.8
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.1		0		1	0		0		0.8
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		1	0		0		0.8
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		1	0		0		0.8
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		1	0		0		0.8
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.7		0.3	0		0.1		0.7
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					0.3					0.7
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		0.3	0		0		0.7
5200 - 8312 - 205 FELLSWAY W	0		0		0.3	0		0		0.7
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		0.3	0		0.1		0.6
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		0.3	0		0		0.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		0.3	0		0		0.6
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		0.3	0		0.1		0.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.3		5.6E-17	0		0.3		0.2
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	0	5.6E-17	0		0.2	0	4.4E-16
Maximum					2.6					3.6
Total	2.8		2.8			3.7		3.7		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:10 (100.0) [9] !Fall 2012!					06:20 (100.3) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY		0			0	3.3	1	0		4.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE					0	0		0		4.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE					0	0		0.3		4
1600 - 9045 - FELLSWAY @ BRADBURY AVE					0	0		0		4
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE					0	0		0.4		3.6
2400 - 5274 - FELLSWAY @ SECOND ST					0	0		0.9		2.7
2800 - 5275 - FELLSWAY @ MYRTLE ST					0	0		0.3		2.4
3200 - 5276 - FELLSWAY @ MEDFORD ST					0	0		0		2.4
3600 - 5277 - FELLSWAY @ MALDEN ST					0	0		0		2.4
4000 - 5279 - FELLSWAY @ WATTS ST					0	0		0.1		2.3
4400 - 8311 - FELLSWAY W @ SALEM ST					0	0		0		2.3
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE	1.4		0		1.4					2.3
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		1.4	0		0		2.3
5200 - 8312 - 205 FELLSWAY W	0		0		1.4	0		0		2.3
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		1.4	0		0.1		2.2
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		1.4	0		0.5		1.7
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		1.4	0		0		1.7
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		1.4	0		0		1.7
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		1.4	0		0		1.7
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.4	0	0	0		0.7	1	0
Maximum					1.4					4.3
Total	1.4		1.4			3.3		3.3		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	06:40 (100.3) [9] !Fall 2012!					07:00 (100.3) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	2.6	0	0		2.6	2.2	0	0		2.2
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		2.6	0.1		0		2.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.6		0.3		2.9	0.2		0.3		2.2
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		2.9	0		0		2.2
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		0.3		2.6	0.1		0.3		2
2400 - 5274 - FELLSWAY @ SECOND ST	0.1		0.2		2.5	0		0.2		1.8
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0		2.5	0.1		0		1.9
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0.2		2.3	0.6		0.1		2.4
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		2.3	0		0		2.4
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.4		1.9	0		0		2.4
4400 - 8311 - FELLSWAY W @ SALEM ST	0		1		0.9	0		0.8		1.6
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					0.9					1.6
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		0.9	0		0.1		1.5
5200 - 8312 - 205 FELLSWAY W	0		0		0.9	0		0		1.5
5600 - 8313 - FELLSWAY W @ FERN RD	0		1		-0.1	0		0.7		0.8
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.2		-0.3	0		0.1		0.7
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		-0.3	0		0.2		0.5
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		-0.3	0		0.1		0.4
7200 - 8317 - FELLSWAY W @ FOSS ST	0.7		0		0.4	0.1		0.2		0.3
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.2	0	0.2	0		0.3	0	6.7E-16
Maximum					2.9					2.4
Total	3.9		4			3.4		3.4		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	07:20 (100.3) [11] !Fall 2012!					07:40 (100.3) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	2.9	0	0		2.9	5.5	1	0		6.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		2.9	0		0		6.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.2		0.1		3	0		0.8		5.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.4		2.6	0		0.2		5.5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.1		1.1		1.6	0		2.2		3.3
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.6		1	0		0.6		2.7
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.5		0.3		1.2	0		0.2		2.5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.1		0.1		1.2	0.4		0		2.9
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		1.2	0		0.2		2.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		1.2	0		0.2		2.5
4400 - 8311 - FELLSWAY W @ SALEM ST	0.1		0.7		0.6	0		0.4		2.1
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					0.6					2.1
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.1		0.5	0		0		2.1
5200 - 8312 - 205 FELLSWAY W	0		0		0.5	0		0		2.1
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.4		0.1	0		0.6		1.5
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		0.1	0		1.6		-0.1
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		0.1	0		0.2		-0.3
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		0.1	0		0		-0.3
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.1		8.3E-17	0		0		-0.3
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.3	0	-0.3	0		0	1	-1.3
Maximum					3					6.5
Total	3.9		4.1			5.9		7.2		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	08:00 (100.3) [6] !Fall 2012!					08:20 (100.3) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	2	0	0		2	2.3	1	0		3.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		2	0.3		0		3.6
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		2	0		0		3.6
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		2	0		0		3.6
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		0.2		1.8	0.5		1.5		2.6
2400 - 5274 - FELLSWAY @ SECOND ST	0.2		0.5		1.5	0		0		2.6
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0.2		1.3	0		0		2.6
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		1.3	0		0		2.6
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		1.3	0		0		2.6
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		1.3	0		0.5		2.1
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.2		1.1	0		1		1.1
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					1.1					1.1
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		1.1	0		0		1.1
5200 - 8312 - 205 FELLSWAY W	0		0		1.1	0		0		1.1
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		1.1	0		0		1.1
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.3		0.8	0		0.5		0.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.8		0	0		0		0.6
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		0	0		0		0.6
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		0	0		0		0.6
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	0	0	0		1	1	-1.4
Maximum					2					3.6
Total	2.2		2.2			3.2		4.5		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	08:40 (100.3) [11] !Fall 2012!					09:15 (100.3) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	2.5	0	0		2.5	2.7	1	0		3.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0.2		2.4	0		0		3.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.1		0.3		2.2	0.2		0.9		3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		2.2	0.1		0		3.1
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.1		0		2.3	0.2		0.8		2.5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.1		2.2	0		0.1		2.4
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0.1		2.1	0		0.5		1.9
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.1		0		2.2	0.2		0.1		2
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.1		2.1	0		0.3		1.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		2.1	0		0.1		1.6
4400 - 8311 - FELLSWAY W @ SALEM ST	0.4		2.2		0.3	0.1		0.2		1.5
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					0.3					1.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.1		0.2	0		0.2		1.3
5200 - 8312 - 205 FELLSWAY W	0		0		0.2	0		0		1.3
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.2		-1.9E-16	0		0.3		1
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.5		-0.5	0		1		8.9E-16
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		-0.5	0		0.3		-0.3
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		-0.5	0		0		-0.3
7200 - 8317 - FELLSWAY W @ FOSS ST	0.1		0.1		-0.5	0		0.4		-0.7
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	0	-0.5	0		0.7	1	-2.4
Maximum					2.5					3.7
Total	3.4		3.7			3.5		5.9		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	09:50 (100.3) [7] !Fall 2012!					10:25 (100.3) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	5	2	0		7	4.4	3	0		7.4
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		7	0		0		7.4
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.7		6.3	0		0.6		6.8
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		1.9		4.5	0		0		6.8
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1		1.3		4.2	0.6		0.9		6.5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.7		3.5	0		0.7		5.8
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0.9		2.6	0		0.6		5.2
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		2.6	0		0.4		4.8
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		2.6	0		0		4.8
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.7		1.9	0		0.3		4.5
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.7		1.2	0		0.1		4.4
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					1.2					4.4
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.4		0.8	0.1		0.3		4.2
5200 - 8312 - 205 FELLSWAY W	0		0.3		0.5	0		0		4.2
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		0.5	0		0		4.2
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.4		0.1	0		0.6		3.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		0.1	0		0		3.6
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0.1		0.1		0.1	0		0		3.6
7200 - 8317 - FELLSWAY W @ FOSS ST	0.1		0		0.2	0		0		3.6
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	2	-1.8	0		0.7	3	-0.1
Maximum					7					7.4
Total	6.4		8.1			5.1		5.1		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	11:00 (100.3) [8] !Fall 2012!					11:35 (100.3) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	6.3	1	0		7.3	7.9	1	0		8.9
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		7.3	0.3		0		9.2
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		0.6		7	0.3		0		9.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.4		0.5		6.9	0.1		0.4		9.2
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.1		0.8		6.2	0.8		0.5		9.5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.8		5.4	0		0.9		8.6
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0.4		5	0		0.8		7.8
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0.1		4.9	0		0.9		6.9
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.6		4.3	0		0.5		6.4
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.3		4	0		0.6		5.8
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.5		3.5	0.9		1.9		4.8
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					3.5					4.8
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.6		2.9	0		0.1		4.7
5200 - 8312 - 205 FELLSWAY W	0		0.1		2.8	0		0.4		4.3
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.3		2.5	0		0.4		3.9
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.4		2.1	0		1.4		2.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.4		1.7	0		0.3		2.2
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		1.7	0		0.3		1.9
7200 - 8317 - FELLSWAY W @ FOSS ST	0.1		0		1.8	0		0.3		1.6
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.8	1	0	0		0.8	1	-0.2
Maximum					7.3					9.5
Total	7.1		7			10.1		10.1		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	12:10 (100.3) [8] !Fall 2012!					12:45 (100.3) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3.9	1	0		4.9	9.2	2	0		11.2
800 - 9318 - CORPORATION WAY AFTER BRIDGE	1.1		0		6	0		0		11.2
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		0		6.3	0		0.4		10.8
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.3		6.1	0		0.5		10.3
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.3		0.3		6.1	0.6		0.8		10.1
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.4		5.7	0.1		0.5		9.7
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0.9		4.8	0		0.8		8.9
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.1		0.6		4.3	0.1		0.4		8.6
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.1		4.2	0		0.7		7.9
4000 - 5279 - FELLSWAY @ WATTS ST	0		1.1		3.1	0.1		1		7
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.5		2.6	0.2		2.5		4.7
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					2.6					4.7
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		2.6	0		0.7		4
5200 - 8312 - 205 FELLSWAY W	0		0		2.6	0		0.1		3.9
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.6		2	0.1		0.6		3.4
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.8		1.2	0		0.9		2.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.4		0.8	0.1		0.2		2.4
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0.1		0.1		0.8	0		0.2		2.2
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		0.8	0.2		0.2		2.2
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.4	1	-0.6	0		0	2	0.2
Maximum					6.3					11.2
Total	5.9		6.4			10.7		10.5		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	Trip (RouteVar) [Observations]									
	13:20 (100.3) [12] !Fall 2012!					13:55 (100.3) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	9	1	0		10	7	1	0		8
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0.3		9.8	0.3		0.1		8.2
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.2		0.9		9.1	0.7		0.3		8.6
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.3		0.5		8.9	0		0.3		8.3
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.8		0.8		8.9	1		0.8		8.5
2400 - 5274 - FELLSWAY @ SECOND ST	0.3		0.5		8.7	0.7		0.7		8.5
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.3		0.9		8.1	0.3		2.3		6.5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.2		1.9		6.4	0.3		0.7		6.1
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.3		6.1	0		0		6.1
4000 - 5279 - FELLSWAY @ WATTS ST	0		1		5.1	0		0.2		5.9
4400 - 8311 - FELLSWAY W @ SALEM ST	0.8		2.1		3.8	1.2		2		5.1
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					3.8					5.1
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.5		3.3	0		0.2		4.9
5200 - 8312 - 205 FELLSWAY W	0		0.2		3.1	0		0.3		4.6
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.3		2.8	0		1.8		2.8
6000 - 8314 - FELLSWAY W @ FULTON ST	0		1.2		1.6	0		1.3		1.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.5		1.1	0		0.3		1.2
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0.1		0.2		1	0.2		1.3		0.1
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.5		0.5	0		0.8		-0.7
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	1	-1.8	0		0.3	1	-2
Maximum					10					8.6
Total	11.7		13.9			11.6		14		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	14:30 (100.3) [7] !Fall 2012!					15:05 (100.3) [7] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	9.3	2	0		11.3	10.7	1	0		11.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		11.3	0		0		11.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.7		1.1		10.9	0.4		0.3		11.8
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		10.9	0		0.1		11.7
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1.1		0		12	0.7		1		11.4
2400 - 5274 - FELLSWAY @ SECOND ST	0		0		12	0		0.3		11.1
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.6		10.4	0.3		1.3		10.1
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0.3		10.1	0		1.1		9
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		10.1	0		0.4		8.6
4000 - 5279 - FELLSWAY @ WATTS ST	0		1		9.1	0		1.1		7.5
4400 - 8311 - FELLSWAY W @ SALEM ST	0.3		1.4		8	0		1.9		5.6
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					8					5.6
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		8	0		0.1		5.5
5200 - 8312 - 205 FELLSWAY W	0		0.9		7.1	0		0.3		5.2
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.3		6.8	0		0.3		4.9
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2.7		4.1	0		1.7		3.2
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.7		3.4	0		1.3		1.9
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.3		3.1	0		0		1.9
7200 - 8317 - FELLSWAY W @ FOSS ST	0.1		0.4		2.8	0.1		0.4		1.6
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.7	2	0.1	0		0.4	1	0.2
Maximum					12					11.8
Total	11.6		11.4			12.3		12.1		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	15:40 (100.3) [14] !Fall 2012!					16:15 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	19.8	1	0		20.8	11.5	2	0		13.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.2		0.1		20.9	0		0		13.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.4		1.1		20.2	0		0		13.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.4		19.9	0		0		13.5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.9		1.4		19.4	2		0		15.5
2400 - 5274 - FELLSWAY @ SECOND ST	0.5		0.4		19.5	0		0		15.5
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		4.9		14.6	0		3		12.5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		2.3		12.3	0		2		10.5
3600 - 5277 - FELLSWAY @ MALDEN ST	0		1.2		11.1	0		4		6.5
4000 - 5279 - FELLSWAY @ WATTS ST	0.1		2.9		8.3	0		5		1.5
4400 - 8311 - FELLSWAY W @ SALEM ST	1		3.2		6.1	0		2		-0.5
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					6.1					-0.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.4		5.7	0		0		-0.5
5200 - 8312 - 205 FELLSWAY W	0		0.5		5.2	0		3		-3.5
5600 - 8313 - FELLSWAY W @ FERN RD	0		1.4		3.8	0		0		-3.5
6000 - 8314 - FELLSWAY W @ FULTON ST	0.1		4.5		-0.6	0		5		-8.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.5		-1.1	0		0		-8.5
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.3		-1.4	0		0		-8.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0.1		0.9		-2.2	0		0		-8.5
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.5	1	-3.7	0		2	2	-12.5
Maximum					20.9					15.5
Total	23.2		26.7			13.5		26		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	16:40 (100.3) [7] !Fall 2012!					17:00 (100.3) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	19.6	2	0		21.6	17	0	0		17
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0		21.7	0		0		17
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.1		1.4		20.4	0		1.5		15.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.1		20.4	0		1.5		14
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1.3		0.6		21.1	0		0		14
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.7		20.4	0		2		12
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.7		18.7	0.5		2		10.5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		3.4		15.3	0		0.5		10
3600 - 5277 - FELLSWAY @ MALDEN ST	0		2.1		13.2	0		3.5		6.5
4000 - 5279 - FELLSWAY @ WATTS ST	0.1		1.7		11.6	0		2		4.5
4400 - 8311 - FELLSWAY W @ SALEM ST	0		2.6		9	0		2		2.5
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					9					2.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.6		8.4	0		1.5		1
5200 - 8312 - 205 FELLSWAY W	0		0		8.4	0		0		1
5600 - 8313 - FELLSWAY W @ FERN RD	0.1		0.6		7.9	0		0		1
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2.7		5.2	0		0		1
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.4		4.8	0		0		1
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.1		4.7	0		0		1
7200 - 8317 - FELLSWAY W @ FOSS ST	0		1.4		3.3	0		1		0
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	2	7.1E-15	0		0	0	0
Maximum					21.7					17
Total	21.6		21.6			17.5		17.5		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	17:20 (100.3) [13] !Fall 2012!					17:40 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	12	0	0		12	33.6	0	0		33.6
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.4		0.4		12	0		0.1		33.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.7		2.3		10.4	0.6		1.3		32.8
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.5		10	0		0		32.8
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.5		1.3		9.2	1		1.4		32.4
2400 - 5274 - FELLSWAY @ SECOND ST	0.2		0.8		8.6	0.3		1.6		31.1
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.1		5.1		3.6	0.3		5.1		26.3
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.2		2.6		1.2	0.5		6.3		20.5
3600 - 5277 - FELLSWAY @ MALDEN ST	0.1		1.3		-3.8E-15	0		1.8		18.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		2.6		-2.6	0		3.6		15.1
4400 - 8311 - FELLSWAY W @ SALEM ST	0.1		1.7		-4.2	0.3		2.6		12.8
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					-4.2					12.8
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.2		-4.4	0		0.9		11.9
5200 - 8312 - 205 FELLSWAY W	0		0.5		-4.9	0		0.5		11.4
5600 - 8313 - FELLSWAY W @ FERN RD	0		1.7		-6.6	0		2.8		8.6
6000 - 8314 - FELLSWAY W @ FULTON ST	0.1		1.9		-8.4	0		3.3		5.3
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.3		-8.7	0.1		0.5		4.9
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.3		-9	0		0.5		4.4
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.5		-9.5	0		2.6		1.8
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.7	0	-11.2	0		1.9	0	-0.1
Maximum					12					33.6
Total	14.5		25.8			36.6		36.6		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:00 (100.3) [13] !Fall 2012!					18:20 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	15.7	0	0		15.7	29.3	1	0		30.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0.1		15.7	0		0		30.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		1.2		14.8	0.1		1.3		29.1
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.5		14.4	0		0.3		28.8
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.7		1		14.1	0.1		1.9		27
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.6		13.5	0		1.4		25.6
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.1		4.2		9.4	0.3		5.8		20.1
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		3		6.4	0.1		2.1		18.1
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.7		5.7	0		2.4		15.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		3.1		2.6	0		3.1		12.6
4400 - 8311 - FELLSWAY W @ SALEM ST	0.2		3.2		-0.4	0		3.3		9.3
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					-0.4					9.3
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.6		-1	0		0		9.3
5200 - 8312 - 205 FELLSWAY W	0.2		0.2		-1	0		0.4		8.9
5600 - 8313 - FELLSWAY W @ FERN RD	0		1.6		-2.6	0		1.8		7.1
6000 - 8314 - FELLSWAY W @ FULTON ST	0		3		-5.6	0.1		3.6		3.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.2		-5.8	0		0.8		2.8
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.2		-6	0		0.3		2.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.8		-6.8	0		0.5		2
7600 - 8301 - FELLSWAY W @ ELM ST	0		2.2	0	-9	0		1.4	1	-0.4
Maximum					15.7					30.3
Total	17.4		26.4			30		30		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	18:40 (100.3) [6] !Fall 2012!					19:00 (100.3) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	23.2	0	0		23.2	17.6	1	0		18.6
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		23.2	0.1		0		18.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.2		1.3		22.1	0.1		0.5		18.3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.2		0		22.3	0		0		18.3
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.5		1.5		21.3	1.3		1.4		18.2
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.2		21.1	0		1.3		16.9
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		4.2		16.9	0.1		3.4		13.6
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		2.3		14.6	0.1		1.1		12.6
3600 - 5277 - FELLSWAY @ MALDEN ST	0		1.2		13.4	0		0.8		11.8
4000 - 5279 - FELLSWAY @ WATTS ST	0		1.8		11.6	0		2		9.8
4400 - 8311 - FELLSWAY W @ SALEM ST	0.2		1.2		10.6	0		1.3		8.5
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					10.6					8.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.7		9.9	0.1		0.6		8
5200 - 8312 - 205 FELLSWAY W	0		1.7		8.2	0		0.8		7.2
5600 - 8313 - FELLSWAY W @ FERN RD	0		1.8		6.4	0		1.3		5.9
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2.2		4.2	0		2.3		3.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		1		3.2	0		1		2.6
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		1.8		1.4	0		0.4		2.2
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		1.4	0		0.3		1.9
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	0	0.1	0		1.4	1	-0.5
Maximum					23.2					18.7
Total	24.2		24.2			19.5		19.5		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

	19:35 (100.3) [8] !Fall 2012!					20:30 (100.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	18.6	2	0		20.6	13.2	1	0		14.2
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		20.6	0		0		14.2
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	1		0.9		20.7	0.3		0.8		13.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		20.7	0.1		0.3		13.5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1.1		2.5		19.3	0.9		1.3		13.1
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.9		18.4	0.1		0.5		12.7
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		3.9		14.5	0		1.4		11.3
3200 - 5276 - FELLSWAY @ MEDFORD ST	0.1		1.6		13	0		1.3		10
3600 - 5277 - FELLSWAY @ MALDEN ST	0		1.3		11.7	0		0.3		9.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		1.1		10.6	0		1.6		8.1
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.5		10.1	0.2		1		7.3
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					10.1					7.3
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		1		9.1	0		0.3		7
5200 - 8312 - 205 FELLSWAY W	0		1.3		7.8	0		0.3		6.7
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.3		7.5	0		0.9		5.8
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2.3		5.2	0.1		1.9		4
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		1.4		3.8	0		1.4		2.6
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.4		3.4	0		1		1.6
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.5		2.9	0		0.5		1.1
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	2	-0.4	0		1	1	-0.9
Maximum					20.7					14.2
Total	20.9		20.9			14.7		15.8		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	21:30 (100.3) [11] !Fall 2012!					22:30 (100.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	11.4	1	0		12.4	14.5	1	0		15.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		12.4	0		0		15.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.5		0.4		12.5	0.2		0.6		15.1
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.4		12.1	0		0		15.1
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.4		1.2		11.3	0.7		0.4		15.4
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.6		10.7	0.1		1.4		14.1
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.1		9.6	0		1.3		12.8
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0.7		8.9	0.2		3		10
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.4		8.5	0		0.2		9.8
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.9		7.6	0		1.6		8.2
4400 - 8311 - FELLSWAY W @ SALEM ST	0.4		1.5		6.5	0		1.7		6.5
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					6.5					6.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0.5		6	0		0.1		6.4
5200 - 8312 - 205 FELLSWAY W	0		0.5		5.5	0		0.4		6
5600 - 8313 - FELLSWAY W @ FERN RD	0.1		0.7		4.9	0.1		0.5		5.6
6000 - 8314 - FELLSWAY W @ FULTON ST	0		1.1		3.8	0		2.1		3.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.6		3.2	0		0.8		2.7
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.8		2.4	0		0.2		2.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.7		1.7	0		0.4		2.1
7600 - 8301 - FELLSWAY W @ ELM ST	0		0.5	1	0.2	0		1.1	1	-3.6E-15
Maximum					12.5					15.5
Total	12.7		12.7			15.7		15.7		

Massachusetts Bay Transportation Authority
Route 100
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	23:30 (100.3) [12] !Fall 2012!					24:30 (100.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	8.8	1	0		9.8	7.3	1	0		8.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		9.8	0		0		8.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.2		9.6	0.1		0		8.4
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.3		9.3	0.2		0.1		8.5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.3		0.8		8.8	0		0.7		7.8
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.8		8	0		0.6		7.2
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.2		6.8	0		0.3		6.9
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		1		5.8	0		1.4		5.5
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.3		5.5	0		0.2		5.3
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.5		5	0.2		0.8		4.7
4400 - 8311 - FELLSWAY W @ SALEM ST	0		1.6		3.4	0		0.4		4.3
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE					3.4					4.3
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		3.4	0		0		4.3
5200 - 8312 - 205 FELLSWAY W	0		0.2		3.2	0		1.2		3.1
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.3		2.9	0		0.3		2.8
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.8		2.1	0		0.3		2.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.1		2	0		0.2		2.3
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0.3		1.7	0		0.1		2.2
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.3		1.4	0		0.6		1.6
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	1	-0.9	0		0.8	1	-0.2
Maximum					9.8					8.5
Total	9		9.8			7.7		7.7		

Massachusetts Bay Transportation Authority

Route 100

Weekday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	Total		
	On	Off	Load
400 - 5271 - WELLINGTON STATION BUSWAY	376.9	0	409.9
800 - 9318 - CORPORATION WAY AFTER BRIDGE	4.4	1.4	412.9
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	8.9	24.2	397.6
1600 - 9045 - FELLSWAY @ BRADBURY AVE	2	9.5	390.1
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	19.7	33.8	376
2400 - 5274 - FELLSWAY @ SECOND ST	2.6	23.2	355.4
2800 - 5275 - FELLSWAY @ MYRTLE ST	3	60.7	297.7
3200 - 5276 - FELLSWAY @ MEDFORD ST	3.3	41.5	259.5
3600 - 5277 - FELLSWAY @ MALDEN ST	0.1	24.9	234.7
4000 - 5279 - FELLSWAY @ WATTS ST	0.5	42.9	192.3
4400 - 8311 - FELLSWAY W @ SALEM ST	6.4	50.7	148
4420 - 5333 - SALEM ST @ FELLSWAY GARAGE	1.4	0	149.4
4800 - 83111 - FELLSWAY W @ FELLS AVE	0.2	10.8	138.8
5200 - 8312 - 205 FELLSWAY W	0.2	14.1	124.9
5600 - 8313 - FELLSWAY W @ FERN RD	0.4	24	101.3
6000 - 8314 - FELLSWAY W @ FULTON ST	0.4	53.1	48.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0.2	14.8	34
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0.5	9.4	25.1
7200 - 8317 - FELLSWAY W @ FOSS ST	1.6	15	11.7
7600 - 8301 - FELLSWAY W @ ELM ST	0	29.9	-51.2
Maximum	0	0	419.4
Total	431.8	481.7	0

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	05:15 (100.3) [2] !Fall 2012!					05:45 (100.3) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	0	0		1	2	0	0		2
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		1	0		0		2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		1	0		0		2
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		1	0		0		2
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		1	0		0		2
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		1	0		0		2
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		1	0.5		0		2.5
3200 - 5264 - FELLSWAY W @ SALEM ST	2.5		0		3.5	1		0		3.5
3600 - 5265 - 1250 FELLSWAY	0		0		3.5	0.5		0		4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3.5	0		0		4
4400 - 5268 - FELLSWAY @ MALDEN ST	1		0		4.5	0		0		4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		4.5	2		0		6
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		4.5	0		0		6
5600 - 5270 - FELLSWAY @ SECOND ST	2.5		0		7	0.5		0		6.5
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		7	0		1		5.5
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		1		6	0.5		0		6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6	0	0	0		6	0	0
Maximum					7					6.5
Total	7		7			7		7		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	06:15 (100.3) [2] !Fall 2012!					06:45 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0	0	0		0	0	0	0		0
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		0	0		0		0
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		0	0		0		0
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		0	0		0		0
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		0	0		0		0
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		0	0		0		0
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		0	0		0		0
3200 - 5264 - FELLSWAY W @ SALEM ST	0.5		0		0.5	0		0		0
3600 - 5265 - 1250 FELLSWAY	1		0		1.5	0		0		0
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		1.5	0		0		0
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		1.5	5		0		5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	2.5		0		4	1		0		6
5200 - 5269 - FELLSWAY @ MYRTLE ST	2.5		0		6.5	1		0		7
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		6.5	0		0		7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.5		0		8	0		0		7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.5		7.5	0		0		7
6800 - 5271 - WELLINGTON STATION BUSWAY	0		7.5	0	0	0		7	0	0
Maximum					8					7
Total	8		8			7		7		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	07:20 (100.3) [1] !Fall 2012!					07:50 (100.3) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0	1	0		1	0.5	0	0		0.5
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		1	1.5		0		2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		1	1		0		3
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		1	0		0		3
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		1	0.5		0		3.5
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		1	0		0		3.5
2800 - 8307 - FELLSWAY W @ GRANT AVE	2		0		3	0.5		0		4
3200 - 5264 - FELLSWAY W @ SALEM ST	4		0		7	0.5		0		4.5
3600 - 5265 - 1250 FELLSWAY	0		0		7	3		0		7.5
4000 - 5266 - FELLSWAY @ EMERALD ST	1		0		8	0		0		7.5
4400 - 5268 - FELLSWAY @ MALDEN ST	1		0		9	1		0		8.5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	1		0		10	0.5		0		9
5200 - 5269 - FELLSWAY @ MYRTLE ST	1		0		11	1.5		0.5		10
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		11	0		0		10
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		1		10	0		0		10
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		10	0		0.5		9.5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		9	1	0	0		9.5	0	0
Maximum					11					10
Total	10		10			10.5		10.5		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	08:20 (100.3) [3] !Fall 2012!					08:50 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1.7	0	0		1.7	0	1	0		1
800 - 8303 - FELLSWAY W @ S BORDER RD	0.3		0		2	0		0		1
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		2	0		0		1
1600 - 48304 - FELLSWAY W @ PARK ST	0.3		0		2.3	0		0		1
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		2.3	0		0		1
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		2.3	0		0		1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		2.3	0		0		1
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		2.3	0		0		1
3600 - 5265 - 1250 FELLSWAY	0.7		0		3	2		0		3
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3	0		0		3
4400 - 5268 - FELLSWAY @ MALDEN ST	0.3		0		3.3	1		0		4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.7		0		4	0		0		4
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0		4.3	3		0		7
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		4.3	0		0		7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		4.3	0		0		7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		4.3	0		1		6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		4.3	0	0	0		5	1	0
Maximum					4.3					7
Total	4.3		4.3			6		6		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	09:20 (100.3) [1] !Fall 2012!					09:50 (100.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0	1	0		1	0	1	0		1
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		1	0.7		0.3		1.4
1200 - 8304 - FELLSWAY W @ FULTON ST	2		0		3	3.7		0		5.1
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3	0.3		0		5.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3	0.3		0		5.7
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3	0		0		5.7
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		3	0		0		5.7
3200 - 5264 - FELLSWAY W @ SALEM ST	1		0		4	2.3		0.3		7.7
3600 - 5265 - 1250 FELLSWAY	0		0		4	0		0		7.7
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		4	0.3		0		8
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		4	1		0		9
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		4	2.7		0		11.7
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		4	1.7		0.3		13.1
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		4	0		0		13.1
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		4	0.7		1.7		12.1
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	2		0		6	0		1.3		10.8
6800 - 5271 - WELLINGTON STATION BUSWAY	0		5	1	0	0		9.7	1	0.1
Maximum					6					13.1
Total	5		5			13.7		13.7		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	10:20 (100.3) [2] !Fall 2012!					10:50 (100.3) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0.5	1	0		1.5	2	1	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		1.5	1		0		4
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		1.5	0		0		4
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		1.5	0		0		4
2000 - 8305 - FELLSWAY W @ PARIS ST	0.5		0		2	1		0		5
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		2	3		0		8
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		2	0		0		8
3200 - 5264 - FELLSWAY W @ SALEM ST	3.5		0		5.5	1		1		8
3600 - 5265 - 1250 FELLSWAY	0		0		5.5	1		0		9
4000 - 5266 - FELLSWAY @ EMERALD ST	1		0		6.5	0		0		9
4400 - 5268 - FELLSWAY @ MALDEN ST	0.5		0		7	0		0		9
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		7	0		0		9
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.5		0		8.5	2		0		11
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		8.5	1		0		12
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0.5		8	1		1		12
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		8	1		1		12
6800 - 5271 - WELLINGTON STATION BUSWAY	0		7	1	0	0		11	1	0
Maximum					8.5					12
Total	7.5		7.5			14		14		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	11:20 (100.3) [1] !Fall 2012!					11:50 (100.3) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0	1	0		1	0	1	0		1
800 - 8303 - FELLSWAY W @ S BORDER RD	2		1		2	1.5		0		2.5
1200 - 8304 - FELLSWAY W @ FULTON ST	3		0		5	1.5		0		4
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		5	0		0		4
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		5	0		0		4
2400 - 8306 - FELLSWAY W @ CHERRY ST	1		0		6	0		0		4
2800 - 8307 - FELLSWAY W @ GRANT AVE	3		0		9	0		0		4
3200 - 5264 - FELLSWAY W @ SALEM ST	6		0		15	1		1		4
3600 - 5265 - 1250 FELLSWAY	0		0		15	0		0		4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		15	0		0		4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		15	0		0		4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	1		0		16	2		0		6
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		16	3		0		9
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		16	0.5		0		9.5
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		16	0.5		2		8
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1		2		15	0.5		0		8.5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		14	1	0	0		7.5	1	0
Maximum					16					9.5
Total	17		17			10.5		10.5		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	12:20 (100.3) [3] !Fall 2012!					12:50 (100.3) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1.7	1	0		2.7	1	2	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	1.7		0		4.4	1		0		4
1200 - 8304 - FELLSWAY W @ FULTON ST	0.7		0		5.1	0.5		0		4.5
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		5.1	0		0		4.5
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		5.1	0.5		0		5
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.7		0		5.8	0		0		5
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		5.8	0		0		5
3200 - 5264 - FELLSWAY W @ SALEM ST	0.7		0		6.5	4		0		9
3600 - 5265 - 1250 FELLSWAY	0		0		6.5	0		0		9
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		6.5	0		0		9
4400 - 5268 - FELLSWAY @ MALDEN ST	0.3		0		6.8	0.5		0		9.5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.3		0		7.1	2		0		11.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	1.3		0		8.4	2.5		0.5		13.5
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		8.4	0		0.5		13
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.3		0.3		8.4	1.5		0.5		14
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0.7		8	0.5		0.5		14
6800 - 5271 - WELLINGTON STATION BUSWAY	0		7.3	1	-0.3	0		12	2	0
Maximum					8.4					14
Total	8		8.3			14		14		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observati									
	13:20 (100.3) [1] !Fall 2012!					13:50 (100.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	1	0		2	1	2	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		2	0.7		0.7		3
1200 - 8304 - FELLSWAY W @ FULTON ST	1		0		3	0.7		0		3.7
1600 - 48304 - FELLSWAY W @ PARK ST	1		0		4	0		0		3.7
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		4	0		0		3.7
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		4	0.7		0		4.4
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		4	0.3		0		4.7
3200 - 5264 - FELLSWAY W @ SALEM ST	0		1		3	2.7		0		7.4
3600 - 5265 - 1250 FELLSWAY	0		0		3	0		0		7.4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3	0		0		7.4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		3	0		0		7.4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		3	0.7		0		8.1
5200 - 5269 - FELLSWAY @ MYRTLE ST	2		0		5	0.3		0		8.4
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		5	0.3		0		8.7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		2		3	0		0		8.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		3	0		1.7		7
6800 - 5271 - WELLINGTON STATION BUSWAY	0		2	1	0	0		5	2	0
Maximum					5					8.7
Total	5		5			7.3		7.3		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	ons]									
	14:20 (100.3) [2] !Fall 2012!					14:50 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	2	0		3	2	1	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		3	0		0		3
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		3	0		0		3
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3	0		0		3
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3	0		0		3
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3	0		0		3
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		3	0		0		3
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		3	1		0		4
3600 - 5265 - 1250 FELLSWAY	0		0		3	2		0		6
4000 - 5266 - FELLSWAY @ EMERALD ST	1.5		0		4.5	0		0		6
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		4.5	0		0		6
4800 - 5267 - FELLSWAY @ CENTRAL AVE	2		0		6.5	0		0		6
5200 - 5269 - FELLSWAY @ MYRTLE ST	1		0		7.5	2		0		8
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		7.5	0		0		8
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	3		1.5		9	0		0		8
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.5		0		9.5	0		0		8
6800 - 5271 - WELLINGTON STATION BUSWAY	0		7.5	2	0	0		7	1	0
Maximum					9.5					8
Total	9		9			7		7		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	15:20 (100.3) [4] !Fall 2012!					15:50 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	3	1	0		4	2	2	0		4
800 - 8303 - FELLSWAY W @ S BORDER RD	0.5		0		4.5	2		0		6
1200 - 8304 - FELLSWAY W @ FULTON ST	0.8		0		5.3	2		0		8
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		5.3	0		0		8
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		5.3	0		0		8
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		5.3	2		0		10
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		5.3	0		0		10
3200 - 5264 - FELLSWAY W @ SALEM ST	0.5		0		5.8	1		2		9
3600 - 5265 - 1250 FELLSWAY	0		0		5.8	0		0		9
4000 - 5266 - FELLSWAY @ EMERALD ST	0.3		0		6.1	0		0		9
4400 - 5268 - FELLSWAY @ MALDEN ST	0.3		0		6.4	0		0		9
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		6.4	0		0		9
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0		6.7	1		0		10
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		6.7	0		0		10
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.5		0		7.2	0		0		10
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		7.2	0		1		9
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6	1	0.2	0		7	2	0
Maximum					7.2					10
Total	6		6			10		10		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	16:20 (100.3) [3] !Fall 2012!					16:50 (100.3) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2	1	0		3	1.5	2	0		3.5
800 - 8303 - FELLSWAY W @ S BORDER RD	1.3		0		4.3	1		0.3		4.2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		4.3	1.3		0		5.5
1600 - 48304 - FELLSWAY W @ PARK ST	0.3		0		4.6	0.5		0		6
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		4.6	0		0		6
2400 - 8306 - FELLSWAY W @ CHERRY ST	0.3		0		4.9	0.3		0		6.3
2800 - 8307 - FELLSWAY W @ GRANT AVE	0.7		0		5.6	0.8		0.3		6.8
3200 - 5264 - FELLSWAY W @ SALEM ST	0.3		0		5.9	1.3		0.3		7.8
3600 - 5265 - 1250 FELLSWAY	0		0		5.9	0		0		7.8
4000 - 5266 - FELLSWAY @ EMERALD ST	1		0		6.9	0.3		0		8.1
4400 - 5268 - FELLSWAY @ MALDEN ST	0.7		0		7.6	0		0		8.1
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0.7		0		8.3	1		0		9.1
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		8.3	1.3		0		10.4
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		8.3	0.3		0		10.7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.3		1.3		7.3	0.8		1.5		10
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0		7.6	0		0		10
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6.7	1	-0.1	0		7.8	2	0.2
Maximum					8.3					10.7
Total	8		8			10		10		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	17:20 (100.3) [1] !Fall 2012!					17:50 (100.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2	1	0		3	0	1	0		1
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		3	0.7		1		0.7
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		3	0.7		0		1.4
1600 - 48304 - FELLSWAY W @ PARK ST	2		0		5	0		0		1.4
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		5	0		0		1.4
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		5	0.7		0		2.1
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		5	0		0		2.1
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		5	0.7		0		2.8
3600 - 5265 - 1250 FELLSWAY	3		0		8	0		0		2.8
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		8	0		0		2.8
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		8	0.3		0		3.1
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		8	0		0		3.1
5200 - 5269 - FELLSWAY @ MYRTLE ST	1		0		9	1.7		0		4.8
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		9	0		0		4.8
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		10	0.7		0.3		5.2
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		10	0		0.3		4.9
6800 - 5271 - WELLINGTON STATION BUSWAY	0		9	1	0	0		3.7	1	0.2
Maximum					10					5.2
Total	9		9			5.3		5.3		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	18:20 (100.3) [1] !Fall 2012!					18:50 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	1	1	0		2	2	1	0		3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		2	0		0		3
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		2	3		0		6
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		2	0		0		6
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		2	0		0		6
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		2	0		0		6
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		2	0		1		5
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		2	0		0		5
3600 - 5265 - 1250 FELLSWAY	0		0		2	0		0		5
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		2	0		0		5
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		2	0		0		5
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		2	0		0		5
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		2	0		0		5
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		2	0		0		5
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		1		2	1		0		6
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		2	0		0		6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		1	1	0	0		5	1	0
Maximum					2					6
Total	2		2			6		6		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	19:20 (100.3) [4] !Fall 2012!					19:50 (100.3) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2.3	2	0		4.3	1	1	0		2
800 - 8303 - FELLSWAY W @ S BORDER RD	0.3		0		4.6	1		0		3
1200 - 8304 - FELLSWAY W @ FULTON ST	0.3		0		4.9	1.8		0		4.8
1600 - 48304 - FELLSWAY W @ PARK ST	0.3		0		5.2	0		0		4.8
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		5.2	0		0		4.8
2400 - 8306 - FELLSWAY W @ CHERRY ST	1		0		6.2	0		0		4.8
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		6.2	0		0		4.8
3200 - 5264 - FELLSWAY W @ SALEM ST	1.3		0		7.5	0.3		0		5.1
3600 - 5265 - 1250 FELLSWAY	0.5		0		8	0.3		0		5.4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		8	0.3		0		5.7
4400 - 5268 - FELLSWAY @ MALDEN ST	0.8		0		8.8	0		0		5.7
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		8.8	0		0		5.7
5200 - 5269 - FELLSWAY @ MYRTLE ST	0.3		0		9.1	1		0		6.7
5600 - 5270 - FELLSWAY @ SECOND ST	0.5		0		9.6	0.3		0		7
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.5		0.8		9.3	0.3		0.5		6.8
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.5		8.8	0		0.8		6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		6.5	2	0.3	0		4.8	1	0.2
Maximum					9.6					7
Total	7.8		7.8			6		6		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	20:50 (100.3) [1] !Fall 2012!					21:16 (100.1) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	2	2	0		4		3			3
800 - 8303 - FELLSWAY W @ S BORDER RD	0		1		3	0		0		3
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		3	0		0		3
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3	0		0		3
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3	0		0		3
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3	0		0		3
2800 - 8307 - FELLSWAY W @ GRANT AVE	1		0		4	0.7		0		3.7
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		4	0.7		0		4.4
3600 - 5265 - 1250 FELLSWAY	2		0		6	0		0		4.4
4000 - 5266 - FELLSWAY @ EMERALD ST	2		0		8	0		0		4.4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		8	0		0		4.4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	4		0		12	0.3		0		4.7
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		12	0.3		0		5
5600 - 5270 - FELLSWAY @ SECOND ST	0		1		11	0.3		0		5.3
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		11	0.7		0		6
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1		0		12	0		0		6
6800 - 5271 - WELLINGTON STATION BUSWAY	0		10	2	0	0		3	3	0
Maximum					12					6
Total	12		12			3		3		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	22:16 (100.1) [3] !Fall 2012!					23:16 (100.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8302 - FELLSWAY W OPP. ELM ST	0	3			3		2			2
800 - 8303 - FELLSWAY W @ S BORDER RD	0		0		3	0		0		2
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		3	0		0		2
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3	0		0		2
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3	0.5		0		2.5
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3	0		0		2.5
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		3	1.5		0		4
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		3	0		0		4
3600 - 5265 - 1250 FELLSWAY	0		0		3	0		0		4
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3	0		0		4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		3	0		0		4
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		3	0		0		4
5200 - 5269 - FELLSWAY @ MYRTLE ST	1		0		4	0		0		4
5600 - 5270 - FELLSWAY @ SECOND ST	1.7		0		5.7	0		0		4
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0.3		6.4	0		0.5		3.5
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.7		5.7	0		0		3.5
6800 - 5271 - WELLINGTON STATION BUSWAY	0		2.7	3	0	0		1.5	2	0
Maximum					6.4					4
Total	3.7		3.7			2		2		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

	24:16 (100.1) [1] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	Off	Load
400 - 8302 - FELLSWAY W OPP. ELM ST		2			2	34.2	0	76.2
800 - 8303 - FELLSWAY W @ S BORDER RD	1		0		3	18.2	4.3	90.1
1200 - 8304 - FELLSWAY W @ FULTON ST	0		0		3	24	0	114.1
1600 - 48304 - FELLSWAY W @ PARK ST	0		0		3	4.7	0	118.8
2000 - 8305 - FELLSWAY W @ PARIS ST	0		0		3	3.3	0	122.1
2400 - 8306 - FELLSWAY W @ CHERRY ST	0		0		3	9.7	0	131.8
2800 - 8307 - FELLSWAY W @ GRANT AVE	0		0		3	11	1.3	141.5
3200 - 5264 - FELLSWAY W @ SALEM ST	0		0		3	37.8	5.6	173.7
3600 - 5265 - 1250 FELLSWAY	0		0		3	16	0	189.7
4000 - 5266 - FELLSWAY @ EMERALD ST	0		0		3	7.7	0	197.4
4400 - 5268 - FELLSWAY @ MALDEN ST	0		0		3	13.7	0	211.1
4800 - 5267 - FELLSWAY @ CENTRAL AVE	0		0		3	24.4	0	235.5
5200 - 5269 - FELLSWAY @ MYRTLE ST	0		0		3	34.5	1.3	268.7
5600 - 5270 - FELLSWAY @ SECOND ST	0		0		3	7.9	1.5	275.1
6000 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		3	16.3	17.7	273.7
6400 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		3	7.6	13.5	267.8
6800 - 5271 - WELLINGTON STATION BUSWAY	0		1	2	0	0	225	0.8
Maximum					3	0	0	286.9
Total	1		1			269.6	269.9	0

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	05:30 (100.3) [2] !Fall 2012!					06:00 (100.3) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3.5	0	0		3.5	3.7	0	0		3.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		3.5	0		0		3.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		3.5	0		0		3.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		3.5	0		0		3.7
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		1		2.5	0		2.5		1.2
2400 - 5274 - FELLSWAY @ SECOND ST	0		0		2.5	0		0		1.2
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0		2.5	0		0		1.2
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		2.5	0		0.5		0.7
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		2.5	0		0		0.7
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		2.5	0		0		0.7
4400 - 8311 - FELLSWAY W @ SALEM ST	0		2.5		0	0		0.5		0.2
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		0	0		0		0.2
5200 - 8312 - 205 FELLSWAY W	0		0		0	0		0		0.2
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		0	0		1		-0.8
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		0	0		0.5		-1.3
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		0	0		0.5		-1.8
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		0	0		0		-1.8
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		0	0		0		-1.8
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	0	0	0		0	0	-1.8
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					3.5					3.7
Total	3.5		3.5			3.7		5.5		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

	06:30 (100.3) [1] !Fall 2012!					07:00 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	9	1	0		10	4	1	0		5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		10	0		0		5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		1		9	0		0		5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		9	0		0		5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		4		5	0		0		5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0		5	0		0		5
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0		5	0		0		5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		5	0		0		5
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		5	0		0		5
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		5	0		4		1
4400 - 8311 - FELLSWAY W @ SALEM ST	0		2		3	0		0		1
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		3	0		0		1
5200 - 8312 - 205 FELLSWAY W	0		0		3	0		0		1
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		3	0		0		1
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2		1	0		0		1
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		1	0		0		1
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		1	0		0		1
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		1	0		0		1
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	1	0	0		0	1	0
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					10					5
Total	9		9			4		4		

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	07:30 (100.3) [2] !Fall 2012!					08:00 (100.3) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3.5	0	0		3.5	2.3	1	0		3.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.5		0		4	0.3		0.5		3.1
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		4	0		0		3.1
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		4	0		0		3.1
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		0		4	0		0		3.1
2400 - 5274 - FELLSWAY @ SECOND ST	0		1		3	0		0		3.1
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0		3	0.3		1		2.4
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		1		2	0		0		2.4
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.5		1.5	0		0		2.4
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		1.5	0		0		2.4
4400 - 8311 - FELLSWAY W @ SALEM ST	0		1		0.5	0		0.7		1.7
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		0.5	0		0		1.7
5200 - 8312 - 205 FELLSWAY W	0		0		0.5	0		0		1.7
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		0.5	0		1.3		0.4
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		0.5	0		0		0.4
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.5		0	0		0.7		-0.3
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		0	0		0		-0.3
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		0	0		0		-0.3
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	0	0	0		0	1	-1.3
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					4					3.3
Total	4		4			2.8		4.2		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	08:30 (100.3) [1] !Fall 2012!					09:00 (100.3) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3	1	0		4	2.5	1	0		3.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	1		0		5	0		0		3.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		5	0		1		2.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		5	0		0		2.5
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1		0		6	1		1		2.5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0		6	0		0		2.5
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1		5	0		0		2.5
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		5	0		0		2.5
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		5	0		0		2.5
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		5	0		0		2.5
4400 - 8311 - FELLSWAY W @ SALEM ST	0		1		4	0		1		1.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		1		3	0		2		-0.5
5200 - 8312 - 205 FELLSWAY W	0		0		3	0		0		-0.5
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		3	0		0		-0.5
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		3	0		0		-0.5
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		1		2	0		0		-0.5
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		1		1	0		0		-0.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		1	0		0		-0.5
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	1	0	0		0	1	-1.5
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					6					3.5
Total	5		5			3.5		5		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	09:30 (100.3) [3] !Fall 2012!					10:00 (100.3) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3.3	2	0		5.3	7	1	0		8
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0		5.6	0		0		8
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		5.6	0		0		8
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.3		5.3	0		0		8
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.3		0.7		4.9	0		1.5		6.5
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.3		4.6	0.5		1		6
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.3		0.7		4.2	0		0		6
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0.3		3.9	0		0		6
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0.3		3.6	0		1		5
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		3.6	0		1		4
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.3		3.3	0		0.5		3.5
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		1.3		2	0		0		3.5
5200 - 8312 - 205 FELLSWAY W	0		0		2	0		0		3.5
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		2	0		0		3.5
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		2	0		0.5		3
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0.3		1.7	0		1		2
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		1.7	0		0		2
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		1.7	0		0		2
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	2	-0.3	0		1	1	0
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					5.6					8
Total	4.3		4.7			7.5		7.5		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	10:30 (100.3) [1] !Fall 2012!					11:00 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	8	2	0		10	7	2	0		9
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		10	0		0		9
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		10	0		0		9
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		10	0		0		9
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		0		10	1		1		9
2400 - 5274 - FELLSWAY @ SECOND ST	0		0		10	0		0		9
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		0		10	0		0		9
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		2		8	0		0		9
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		8	0		3		6
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		8	0		5		1
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0		8	0		0		1
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		8	1		0		2
5200 - 8312 - 205 FELLSWAY W	0		4		4	0		2		0
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		4	0		0		0
6000 - 8314 - FELLSWAY W @ FULTON ST	0		2		2	0		0		0
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		2	0		0		0
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		2	0		0		0
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		2	0		0		0
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	2	0	0		0	2	-2
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					10					9
Total	8		8			9		11		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:30 (100.3) [2] !Fall 2012!					12:00 (100.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	3	1	0		4	3	1	0		4
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		4	0		0		4
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		4	0.3		0		4.3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.5		3.5	0		1		3.3
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	1.5		0		5	0.3		1		2.6
2400 - 5274 - FELLSWAY @ SECOND ST	0.5		0		5.5	0.3		0		2.9
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.5		4	0.3		0		3.2
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		4	0		0.3		2.9
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		4	0		0		2.9
4000 - 5279 - FELLSWAY @ WATTS ST	0		0.5		3.5	0.3		0		3.2
4400 - 8311 - FELLSWAY W @ SALEM ST	1		0.5		4	0		1		2.2
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		4	0		0		2.2
5200 - 8312 - 205 FELLSWAY W	0		0		4	0		0		2.2
5600 - 8313 - FELLSWAY W @ FERN RD	0		1		3	0		0.3		1.9
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0		3	0		0.3		1.6
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		0		3	0		0.7		0.9
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		3	0.3		0.7		0.5
7200 - 8317 - FELLSWAY W @ FOSS ST	0		2		1	0		0		0.5
7600 - 8301 - FELLSWAY W @ ELM ST	0		0	1	0	0		0	1	-0.5
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					5.5					4.3
Total	6		6			5		5.3		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	12:30 (100.3) [2] !Fall 2012!					13:00 (100.3) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	8	2	0		10	1.7	2	0		3.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		10	0		0		3.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0		10	0		0		3.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE	1.5		0		11.5	0		0		3.7
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0.5		2		10	0		1		2.7
2400 - 5274 - FELLSWAY @ SECOND ST	0		0.5		9.5	0		0		2.7
2800 - 5275 - FELLSWAY @ MYRTLE ST	0.5		0.5		9.5	0		3		-0.3
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		1		8.5	0		0		-0.3
3600 - 5277 - FELLSWAY @ MALDEN ST	0		1		7.5	0		0		-0.3
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		7.5	0		0		-0.3
4400 - 8311 - FELLSWAY W @ SALEM ST	0		1		6.5	0		0		-0.3
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		6.5	0		0		-0.3
5200 - 8312 - 205 FELLSWAY W	0		0.5		6	0		0		-0.3
5600 - 8313 - FELLSWAY W @ FERN RD	0		0		6	0		0		-0.3
6000 - 8314 - FELLSWAY W @ FULTON ST	0.5		1		5.5	0		0		-0.3
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		2.5		3	0		0		-0.3
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		3	0		0		-0.3
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0		3	0		0		-0.3
7600 - 8301 - FELLSWAY W @ ELM ST	0		1	2	0	0		2	2	-4.3
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.		.
Maximum					11.5					3.7
Total	11		11			1.7		6		

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]								
	13:30 (100.3) [3] !Fall 2012!					14:00 (100.3) [2] !Fall 2012!			
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	8	1	0		9	6.5	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		9	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.7		8.3	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.3		0.3		8.3	0.5		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	0		1.3		7	2		0.5	
2400 - 5274 - FELLSWAY @ SECOND ST	0.3		0.7		6.6	0		1	
2800 - 5275 - FELLSWAY @ MYRTLE ST	0		1.3		5.3	0		0	
3200 - 5276 - FELLSWAY @ MEDFORD ST	0		0		5.3	0		0	
3600 - 5277 - FELLSWAY @ MALDEN ST	0		0		5.3	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	0		0		5.3	0		1.5	
4400 - 8311 - FELLSWAY W @ SALEM ST	0		0.3		5	0		0.5	
4800 - 83111 - FELLSWAY W @ FELLS AVE	0		0		5	0		1	
5200 - 8312 - 205 FELLSWAY W	0		0		5	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	0		0.7		4.3	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	0		0.3		4	0		2.5	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	0		1.3		2.7	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	0		0		2.7	0		0	
7200 - 8317 - FELLSWAY W @ FOSS ST	0		0.3		2.4	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	0		1.3	1	0.1	0		2	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.		.		.	.		.	
Maximum					9				
Total	8.7		8.7			9		9	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	Load	14:30 (100.3) [1] !Fall 2012!				Load	15:00 (100.3) [4] !Fall 2012!			
		On	BuildOn	Off	BuildOff		On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	7.5	8	2	0		10	6.4	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	7.5	0		0		10	0.1		0.4	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	7.5	0		2		8	0.3		0.8	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	8	0		0		8	0		1.3	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	9.5	3		0		11	1		0.3	
2400 - 5274 - FELLSWAY @ SECOND ST	8.5	0		0		11	0		0.5	
2800 - 5275 - FELLSWAY @ MYRTLE ST	8.5	0		1		10	0		0.8	
3200 - 5276 - FELLSWAY @ MEDFORD ST	8.5	0		1		9	0		0.5	
3600 - 5277 - FELLSWAY @ MALDEN ST	8.5	0		0		9	0		0.3	
4000 - 5279 - FELLSWAY @ WATTS ST	7	0		0		9	0		0.5	
4400 - 8311 - FELLSWAY W @ SALEM ST	6.5	0		4		5	0		1.3	
4800 - 83111 - FELLSWAY W @ FELLS AVE	5.5	0		0		5	0		0.5	
5200 - 8312 - 205 FELLSWAY W	5.5	0		0		5	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	5.5	0		0		5	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	3	0		0		5	0		1.3	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	3	0		2		3	0		0.5	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	3	0		0		3	0		0.3	
7200 - 8317 - FELLSWAY W @ FOSS ST	3	0		0		3	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	0	0		1	2	0	0		3.3	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	9.5					11				
Total		11		11			7.8		12.2	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

		15:30 (100.3) [1] !Fall 2012!					16:00 (100.3) [3] !Fall 2012!			
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	7.4	9	2	0		11	10.7	2	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	7.1	0		0		11	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	6.6	0		0		11	0.3		2	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	5.3	1		0		12	0.3		0.3	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	6	0		0		12	0.3		1	
2400 - 5274 - FELLSWAY @ SECOND ST	5.5	0		0		12	0		0	
2800 - 5275 - FELLSWAY @ MYRTLE ST	4.7	0		0		12	0		2	
3200 - 5276 - FELLSWAY @ MEDFORD ST	4.2	0		2		10	0		1	
3600 - 5277 - FELLSWAY @ MALDEN ST	3.9	0		0		10	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	3.4	0		0		10	0		0.3	
4400 - 8311 - FELLSWAY W @ SALEM ST	2.1	0		3		7	0		1.3	
4800 - 83111 - FELLSWAY W @ FELLS AVE	1.6	0		0		7	0		1	
5200 - 8312 - 205 FELLSWAY W	1.6	0		0		7	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	1.6	0		3		4	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	0.3	0		0		4	0		1	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	-0.2	0		0		4	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	-0.5	0		0		4	0		0	
7200 - 8317 - FELLSWAY W @ FOSS ST	-0.5	1		0		5	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	-4.8	0		3	2	0	0		1.7	2
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	7.4					12				
Total		11		11			11.7		11.7	

Massachusetts Bay Transportation Authority
Route 100
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

		16:30 (100.3) [4] !Fall 2012!					17:00 (100.3) [1] !Fall 2012!			
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	12.7	6.6	1	0		7.6	5.5	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	12.7	0.2		0		7.8	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	11	1.3		0		9.1	1		1	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	11	0.3		0.3		9.1	0		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	10.3	1		0.5		9.6	2		1	
2400 - 5274 - FELLSWAY @ SECOND ST	10.3	0		0		9.6	0		1	
2800 - 5275 - FELLSWAY @ MYRTLE ST	8.3	0		0.8		8.8	1		1	
3200 - 5276 - FELLSWAY @ MEDFORD ST	7.3	0		1.5		7.3	0		0	
3600 - 5277 - FELLSWAY @ MALDEN ST	7.3	0		0.3		7	0		1	
4000 - 5279 - FELLSWAY @ WATTS ST	7	0		0.3		6.7	0		3	
4400 - 8311 - FELLSWAY W @ SALEM ST	5.7	0		0.8		5.9	0		4	
4800 - 83111 - FELLSWAY W @ FELLS AVE	4.7	0		0.5		5.4	0		0	
5200 - 8312 - 205 FELLSWAY W	4.7	0		0.5		4.9	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	4.7	0		0.5		4.4	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	3.7	0		2.3		2.1	0		0	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	3.7	0		0.8		1.3	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	3.7	0		0		1.3	0		1	
7200 - 8317 - FELLSWAY W @ FOSS ST	3.7	0		0.3		1	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	0	0		1.8	1	-1.8	0		2	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	12.7					9.6				
Total		9.3		10.8			9.5		15	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

		17:30 (100.3) [3] !Fall 2012!					18:00 (100.3) [1] !Fall 2012!			
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	6.5	10.3	1	0		11.3	3.5	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	6.5	0		0		11.3	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	6.5	0.7		0.7		11.3	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	6.5	0		0.3		11	0		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	7.5	1		1.7		10.3	0		0	
2400 - 5274 - FELLSWAY @ SECOND ST	6.5	0		0		10.3	0		0	
2800 - 5275 - FELLSWAY @ MYRTLE ST	6.5	0		3		7.3	0		2	
3200 - 5276 - FELLSWAY @ MEDFORD ST	6.5	0		0.3		7	0		1	
3600 - 5277 - FELLSWAY @ MALDEN ST	5.5	0		0		7	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	2.5	0		0.3		6.7	0		2	
4400 - 8311 - FELLSWAY W @ SALEM ST	-1.5	0		1.7		5	2		0	
4800 - 83111 - FELLSWAY W @ FELLS AVE	-1.5	0		0		5	0		0	
5200 - 8312 - 205 FELLSWAY W	-1.5	0		0		5	0		2	
5600 - 8313 - FELLSWAY W @ FERN RD	-1.5	0		0		5	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	-1.5	0		0		5	0		3	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	-1.5	0		0.7		4.3	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	-2.5	0		0.7		3.6	0		0	
7200 - 8317 - FELLSWAY W @ FOSS ST	-2.5	0		0.7		2.9	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	-5.5	0		2	1	-0.1	0		0	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	7.5					11.3				
Total		12		12			5.5		10	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

		18:30 (100.3) [1] !Fall 2012!					19:00 (100.3) [4] !Fall 2012!			
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	4.5	7	1	0		8	10	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	4.5	0		0		8	0.3		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	4.5	0		0		8	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	4.5	0		0		8	0		0.8	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	4.5	0		0		8	0.3		0.8	
2400 - 5274 - FELLSWAY @ SECOND ST	4.5	0		0		8	0		1	
2800 - 5275 - FELLSWAY @ MYRTLE ST	2.5	0		1		7	0.3		3	
3200 - 5276 - FELLSWAY @ MEDFORD ST	1.5	0		1		6	0		0.8	
3600 - 5277 - FELLSWAY @ MALDEN ST	1.5	0		1		5	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	-0.5	0		0		5	0		0.3	
4400 - 8311 - FELLSWAY W @ SALEM ST	1.5	0		3		2	0.3		1.3	
4800 - 83111 - FELLSWAY W @ FELLS AVE	1.5	0		0		2	0		0	
5200 - 8312 - 205 FELLSWAY W	-0.5	0		0		2	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	-0.5	0		0		2	0		0.5	
6000 - 8314 - FELLSWAY W @ FULTON ST	-3.5	0		0		2	0		0.3	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	-3.5	0		0		2	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	-3.5	0		0		2	0		0.5	
7200 - 8317 - FELLSWAY W @ FOSS ST	-3.5	0		0		2	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	-4.5	0		1	1	0	0		2	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	4.5					8				
Total		7		7			11		11	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

		19:35 (100.3) [4] !Fall 2012!					20:30 (100.3) [1] !Fall 2012!			
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	11	9.8	1	0		10.8	12	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	11.3	0		0		10.8	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	11.3	0.3		0.8		10.3	1		2	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	10.5	0		0.3		10	0		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	10	1.3		1.8		9.5	0		0	
2400 - 5274 - FELLSWAY @ SECOND ST	9	0		0.5		9	0		0	
2800 - 5275 - FELLSWAY @ MYRTLE ST	6.3	0.3		2		7.3	0		2	
3200 - 5276 - FELLSWAY @ MEDFORD ST	5.5	0		0.3		7	0		2	
3600 - 5277 - FELLSWAY @ MALDEN ST	5.5	0		0.8		6.2	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	5.2	0		0.8		5.4	0		0	
4400 - 8311 - FELLSWAY W @ SALEM ST	4.2	0.5		1.5		4.4	0		2	
4800 - 83111 - FELLSWAY W @ FELLS AVE	4.2	0		0		4.4	0		2	
5200 - 8312 - 205 FELLSWAY W	4.2	0		0.3		4.1	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	3.7	0		0		4.1	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	3.4	0		1		3.1	0		3	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	3.4	0		0		3.1	0		0	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	2.9	0		0		3.1	0		0	
7200 - 8317 - FELLSWAY W @ FOSS ST	2.9	0		0.8		2.3	0		0	
7600 - 8301 - FELLSWAY W @ ELM ST	-0.1	0		1.5	1	-0.2	0		0	1
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	.		.		.	.		.	
Maximum	11.3					10.8				
Total		12		12			13		13	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name		21:30 (100.1) [3] !Fall 2012!					22:30 (100.1) [2] !Fall 2012!			
	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	13	6.7	2	0		8.7	7	2	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	13	0		0		8.7	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	12	0		0		8.7	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	12	0		0		8.7	0		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	12	0.7		0		9.4	0.5		0.5	
2400 - 5274 - FELLSWAY @ SECOND ST	12	0		0.3		9.1	0		2	
2800 - 5275 - FELLSWAY @ MYRTLE ST	10	0		0		9.1	0		0	
3200 - 5276 - FELLSWAY @ MEDFORD ST	8	0		1		8.1	0		1	
3600 - 5277 - FELLSWAY @ MALDEN ST	8	0		1.3		6.8	0		1.5	
4000 - 5279 - FELLSWAY @ WATTS ST	8	0		0		6.8	0		0	
4400 - 8311 - FELLSWAY W @ SALEM ST	6	0		1		5.8	0		0.5	
4800 - 83111 - FELLSWAY W @ FELLS AVE	4	0		0.3		5.5	0		0	
5200 - 8312 - 205 FELLSWAY W	4	0		1.3		4.2	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	4	0		0		4.2	0		1	
6000 - 8314 - FELLSWAY W @ FULTON ST	1	0		1		3.2	0		0	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	1	0		0.7		2.5	0		1	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	1					2.5				
7200 - 8317 - FELLSWAY W @ FOSS ST	1					2.5				
7600 - 8301 - FELLSWAY W @ ELM ST	0				2	0.5				2
7620 - 8303 - FELLSWAY W @ S BORDER RD	.	0		0.3		0	0		0	
Maximum	13					9.4				
Total		7.3		7.3			7.5		7.5	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	23:30 (100.1) [1] !Fall 2012!					24:30 (100.1) [2] !Fall 2012!				
	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	9	6	2	0		8	5	1	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	9	0		0		8	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	9	0		0		8	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	9	0		0		8	0		0	
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	9	0		0		8	0		0.5	
2400 - 5274 - FELLSWAY @ SECOND ST	7	0		0		8	0		0.5	
2800 - 5275 - FELLSWAY @ MYRTLE ST	7	0		0		8	0		2	
3200 - 5276 - FELLSWAY @ MEDFORD ST	6	0		0		8	0		0	
3600 - 5277 - FELLSWAY @ MALDEN ST	4.5	0		0		8	0		0	
4000 - 5279 - FELLSWAY @ WATTS ST	4.5	0		3		5	0		0.5	
4400 - 8311 - FELLSWAY W @ SALEM ST	4	0		0		5	0		0.5	
4800 - 83111 - FELLSWAY W @ FELLS AVE	4	0		0		5	0		0	
5200 - 8312 - 205 FELLSWAY W	4	0		0		5	0		0	
5600 - 8313 - FELLSWAY W @ FERN RD	3	0		0		5	0		0	
6000 - 8314 - FELLSWAY W @ FULTON ST	3	0		0		5	0		0.5	
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	2	0		0		5	0		0.5	
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	2					5				
7200 - 8317 - FELLSWAY W @ FOSS ST	2					5				
7600 - 8301 - FELLSWAY W @ ELM ST	0				2	3				1
7620 - 8303 - FELLSWAY W @ S BORDER RD	0	0		3		0	0		0	
Maximum	9					8				
Total		6		6			5		5	

Massachusetts Bay Transportation Authority

Route 100

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

		Total		
Seq - StopID - Stop Name	Load	On	Off	Load
400 - 5271 - WELLINGTON STATION BUSWAY	6	210.5	0	252.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	6	2.7	0.9	254.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	6	5.2	12	247.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	6	3.9	5.4	246
2000 - 5215 - FELLSWAY @ RIVERSIDE AVE	5.5	18.7	25.6	239.1
2400 - 5274 - FELLSWAY @ SECOND ST	5	1.6	10.3	230.4
2800 - 5275 - FELLSWAY @ MYRTLE ST	3	3	29.6	203.8
3200 - 5276 - FELLSWAY @ MEDFORD ST	3	0	18.5	185.3
3600 - 5277 - FELLSWAY @ MALDEN ST	3	0	12	173.3
4000 - 5279 - FELLSWAY @ WATTS ST	2.5	0.3	23	150.6
4400 - 8311 - FELLSWAY W @ SALEM ST	2	3.8	38.7	115.7
4800 - 83111 - FELLSWAY W @ FELLS AVE	2	1	9.6	107.1
5200 - 8312 - 205 FELLSWAY W	2	0	10.6	96.5
5600 - 8313 - FELLSWAY W @ FERN RD	2	0	9.3	87.2
6000 - 8314 - FELLSWAY W @ FULTON ST	1.5	0.5	22.5	65.2
6400 - 8315 - FELLSWAY W @ RIDGEWAY RD - RO	1	0	14.7	50.5
6800 - 8316 - FELLSWAY W @ FULTON SPRINGS R	1	0.3	4.2	46.6
7200 - 8317 - FELLSWAY W @ FOSS ST	1	1	4.1	43.5
7600 - 8301 - FELLSWAY W @ ELM ST	0	0	26.6	-25.1
7620 - 8303 - FELLSWAY W @ S BORDER RD	0	0	3.3	0
Maximum	6	0	0	266.6
Total		252.3	279.9	0

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	05:11 (104.0) [4] !Fall 2012!					05:31 (104.0) [5] !Fall 2012!					05:48 (104.0) [7] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	3.3	1	0		4.3	1	0	0		1	0.1	0	0		0.1
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		4.3	0		0		1	0		0.4		-0.3
3 - 5342 - MAIN ST OPP PLEASANT ST	0.8		0		5.1	1.2		0		2.2	0		0.1		-0.4
4 - 5343 - FERRY ST @ CENTRE ST	0		0		5.1	0		0		2.2	0		0.1		-0.5
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		5.1	0.6		0		2.8	0		0		-0.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		0		5.6	0		0		2.8	0.7		0		0.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1		0		6.6	0.6		0		3.4	1.6		0		1.8
8 - 5347 - FERRY ST @ CROSS ST	0		0		6.6	1.4		0		4.8	0		0		1.8
9 - 5348 - FERRY ST @ WINTHROP ST	2.3		0		8.9	0		0		4.8	0.9		0		2.7
10 - 5349 - FERRY ST @ BELMONT ST	3.8		0		12.7	1		0		5.8	0.6		0		3.3
11 - 5350 - FERRY ST @ BENNETT ST	0		0		12.7	0.6		0		6.4	2		0		5.3
12 - 5351 - FERRY ST @ CENTRAL AVE	2.5		0		15.2	3.8		0		10.2	2		0		7.3
13 - 5352 - FERRY ST @ GLENDALE ST	2		0		17.2	2.4		0		12.6	0.6		0.1		7.8
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.3		0		17.5	0		0		12.6	0		0		7.8
15 - 5354 - FERRY ST @ BROADWAY	1.3		0.3		18.5	3.4		0.2		15.8	5		0.9		11.9
16 - 5489 - BROADWAY @ WAVERLY AVE	2.5		0		21	2		0.2		17.6	1.1		0		13
17 - 5490 - BROADWAY @ RAYMOND ST	3		0		24	2.8		0		20.4	1.4		0.3		14.1
18 - 5492 - BROADWAY @ HANCOCK ST	5.8		0		29.8	4		0		24.4	5.9		0		20
19 - 5493 - BROADWAY @ PLEASANT ST	2.5		0.5		31.8	0.6		0		25	1		0.1		20.9
20 - 5494 - BROADWAY @ WEBSTER ST	3		0		34.8	0.6		0.2		25.4	1.3		0		22.2
21 - 5495 - BROADWAY @ CHURCH ST	1		0		35.8	0.8		0		26.2	1.1		0		23.3
22 - 5496 - BROADWAY @ NORWOOD ST	8.8		0		44.6	7.4		1.4		32.2	4.1		0.3		27.1
23 - 5559 - BROADWAY OPP SECOND ST	2.5		0.3		46.8	0.4		0.2		32.4	0.7		0.3		27.5
24 - 5560 - BROADWAY @ GLADSTONE ST	2.5		0.8		48.5	2		0.2		34.2	0.7		0.1		28.1
25 - 5497 - BROADWAY @ BOWDOIN ST	2.5		0.3		50.7	0.2		0.2		34.2	0.6		0		28.7
26 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.8		50.2	0.4		0		34.6	1.3		0		30
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		51.2	2.8		0		37.4	1.4		0		31.4
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		51.2	0		0		37.4	0		0		31.4
29 - 5501 - OPP 173 ALFORD ST	0		0	1	50.2	0		0	0	37.4	0		0	0	31.4
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		50.2	0		0		37.4	0		0		31.4
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		50.2	0		0		37.4	0		0		31.4
32 - 5502 - ALFORD ST @ WEST ST	0		0		50.2	0		0		37.4	0		0		31.4
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		50		0.2	0		36.6		0.8	0		34.9		-3.5
Maximum					51.2					37.4					31.4
Total	52.8		52.8			40		39.2			34.1		37.7		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	06:00 (104.0) [4] !Fall 2012!					06:13 (104.0) [8] !Fall 2012!					06:28 (104.0) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0.5	0	0		0.5	3.9	0	0		3.9	3.8	1	0		4.8
2 - 5289 - CENTRE ST @ STOP & SHOP	0.3		0		0.8	0		0		3.9	0		0		4.8
3 - 5342 - MAIN ST OPP PLEASANT ST	1.3		0		2.1	0		0.1		3.8	0.3		0.1		5
4 - 5343 - FERRY ST @ CENTRE ST	0		0		2.1	0		0.1		3.7	0		0		5
5 - 5344 - FERRY ST @ EASTERN AVE	0.3		0		2.4	0.1		0.1		3.7	0.9		0.1		5.8
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		0.5		1.9	0		0		3.7	0.1		0		5.9
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.3		0		2.2	0.3		0.1		3.9	0.4		0		6.3
8 - 5347 - FERRY ST @ CROSS ST	1		0		3.2	1		0		4.9	0.1		0		6.4
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		3.2	0		0		4.9	0		0		6.4
10 - 5349 - FERRY ST @ BELMONT ST	0.8		0		4	0.9		0.3		5.5	1.9		0.5		7.8
11 - 5350 - FERRY ST @ BENNETT ST	1		0		5	0		0		5.5	0.3		0		8.1
12 - 5351 - FERRY ST @ CENTRAL AVE	3.3		0		8.3	2		0.3		7.2	1.4		0.3		9.2
13 - 5352 - FERRY ST @ GLENDALE ST	1.5		0		9.8	3.1		0		10.3	3.4		0.1		12.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		9.8	0		0		10.3	0		0		12.5
15 - 5354 - FERRY ST @ BROADWAY	4.5		0.3		14	3.1		0.4		13	3.6		0.3		15.8
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		14	1.5		0		14.5	0.9		0		16.7
17 - 5490 - BROADWAY @ RAYMOND ST	3.5		0		17.5	3.5		0.1		17.9	6		0.3		22.4
18 - 5492 - BROADWAY @ HANCOCK ST	3.3		0		20.8	3.3		0		21.2	1.9		0.3		24
19 - 5493 - BROADWAY @ PLEASANT ST	1		0		21.8	0.8		0		22	1.1		0.3		24.8
20 - 5494 - BROADWAY @ WEBSTER ST	0.5		0.3		22	1.4		0.1		23.3	1.5		0.1		26.2
21 - 5495 - BROADWAY @ CHURCH ST	0		0		22	0.3		0		23.6	0.4		0		26.6
22 - 5496 - BROADWAY @ NORWOOD ST	1		1		22	2.3		0.8		25.1	2.4		0.5		28.5
23 - 5559 - BROADWAY OPP SECOND ST	1.5		0.8		22.7	0.4		0.3		25.2	1.1		0.3		29.3
24 - 5560 - BROADWAY @ GLADSTONE ST	2.8		0.5		25	1.4		0.5		26.1	1.6		0.5		30.4
25 - 5497 - BROADWAY @ BOWDOIN ST	0.8		0.3		25.5	0.9		0.4		26.6	0.8		0.1		31.1
26 - 5498 - BROADWAY OPP BEACHAM ST	0.5		0.3		25.7	1		0.3		27.3	0.8		0.1		31.8
27 - 5499 - BROADWAY OPP THORNDIKE ST	2		0		27.7	0.9		0		28.2	1.1		0.1		32.8
28 - 5500 - BROADWAY @ HORIZON WAY	0.3		0		28	0.3		0		28.5	0.9		0		33.7
29 - 5501 - OPP 173 ALFORD ST	0		0	0	28	0		0	0	28.5	0		0	1	32.7
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		28	0		0		28.5	0		0.1		32.6
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		28	0		0		28.5	0		0		32.6
32 - 5502 - ALFORD ST @ WEST ST	0		0		28	0		1.5		27	0		0.8		31.8
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		28		0	0		26.8		0.2	0		32.3		-0.5
Maximum					28					28.5					33.7
Total	31.5		31.8			32		32			36.4		37		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	06:41 (104.0) [11] !Fall 2012!					06:55 (104.0) [3] !Fall 2012!					07:07 (104.0) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	3	0	0		3	1	0	0		1	6.6	0	0		6.6
2 - 5289 - CENTRE ST @ STOP & SHOP	0.2		0		3.2	0		0		1	0.1		0		6.7
3 - 5342 - MAIN ST OPP PLEASANT ST	0.3		0		3.5	0		0		1	3.1		0.4		9.4
4 - 5343 - FERRY ST @ CENTRE ST	0		0		3.5	0		0		1	0		0.7		8.7
5 - 5344 - FERRY ST @ EASTERN AVE	0.4		0.1		3.8	0		0		1	0.1		0		8.8
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		0.1		4.2	0		0		1	0		0.6		8.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.3		0		4.5	1		0		2	0.4		2.6		6
8 - 5347 - FERRY ST @ CROSS ST	0.3		0.7		4.1	0		0		2	0.7		2.1		4.6
9 - 5348 - FERRY ST @ WINTHROP ST	0.7		0.1		4.7	0.3		0		2.3	0.3		0		4.9
10 - 5349 - FERRY ST @ BELMONT ST	1.8		0.2		6.3	0.3		0		2.6	0.4		0.7		4.6
11 - 5350 - FERRY ST @ BENNETT ST	1.3		0		7.6	0.7		0		3.3	0.3		0		4.9
12 - 5351 - FERRY ST @ CENTRAL AVE	1.1		0		8.7	0		0		3.3	1.4		0		6.3
13 - 5352 - FERRY ST @ GLENDALE ST	1.1		0		9.8	3		0		6.3	1.9		0		8.2
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	1.3		0.2		10.9	0		0		6.3	0		0		8.2
15 - 5354 - FERRY ST @ BROADWAY	4.3		0.4		14.8	2		0.3		8	1.4		3.3		6.3
16 - 5489 - BROADWAY @ WAVERLY AVE	1.9		0		16.7	0.7		0		8.7	2		0		8.3
17 - 5490 - BROADWAY @ RAYMOND ST	4		0		20.7	0		0		8.7	1.6		0		9.9
18 - 5492 - BROADWAY @ HANCOCK ST	4.3		0.3		24.7	0.7		0		9.4	2.9		0		12.8
19 - 5493 - BROADWAY @ PLEASANT ST	0.7		0.9		24.5	1		1		9.4	0.7		7.6		5.9
20 - 5494 - BROADWAY @ WEBSTER ST	0.4		0.5		24.4	0.3		0		9.7	1		0.4		6.5
21 - 5495 - BROADWAY @ CHURCH ST	0.5		0		24.9	0		0		9.7	0.6		0		7.1
22 - 5496 - BROADWAY @ NORWOOD ST	2.3		1.6		25.6	2		0.7		11	2.7		3.6		6.2
23 - 5559 - BROADWAY OPP SECOND ST	0.5		0.5		25.6	0		0		11	1.3		1.3		6.2
24 - 5560 - BROADWAY @ GLADSTONE ST	0.8		0.4		26	1		0.7		11.3	1		2.1		5.1
25 - 5497 - BROADWAY @ BOWDOIN ST	0.8		0.1		26.7	0.3		0		11.6	0.3		1.3		4.1
26 - 5498 - BROADWAY OPP BEACHAM ST	1		0.5		27.2	0		0		11.6	0.1		1.6		2.6
27 - 5499 - BROADWAY OPP THORNDIKE ST	2		0.1		29.1	1.7		0		13.3	1.1		0		3.7
28 - 5500 - BROADWAY @ HORIZON WAY	0.6		0		29.7	0		0		13.3	0.1		0		3.8
29 - 5501 - OPP 173 ALFORD ST	0		0	0	29.7	0		0	0	13.3	0		0	0	3.8
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		29.7	0		0		13.3	0		0		3.8
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		29.7	0		0		13.3	0		0		3.8
32 - 5502 - ALFORD ST @ WEST ST	0		0.4		29.3	0		0		13.3	0		0.4		3.4
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		29.2		0.1	0		16.7		-3.4	0		2.9		0.5
Maximum					29.7					13.3					12.8
Total	36.2		36.2			16		19.3			32.3		31.6		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	07:21 (104.0) [6] !Fall 2012!					07:35 (104.0) [1] !Fall 2012!					07:49 (104.0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	11.3	1	0		12.3	4	1	0		5	4.2	0	0		4.2
2 - 5289 - CENTRE ST @ STOP & SHOP	0.3		0.3		12.3	0		0		5	0		0		4.2
3 - 5342 - MAIN ST OPP PLEASANT ST	3.3		0.3		15.3	0		0		5	2.6		0.6		6.2
4 - 5343 - FERRY ST @ CENTRE ST	0.2		0		15.5	0		0		5	0.5		0.3		6.4
5 - 5344 - FERRY ST @ EASTERN AVE	1		0.2		16.3	0		2		3	0.5		1		5.9
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		0.8		16	0		0		3	0		0.5		5.4
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1.2		3.2		14	0		0		3	0.3		0		5.7
8 - 5347 - FERRY ST @ CROSS ST	1.2		1.2		14	0		0		3	0		0		5.7
9 - 5348 - FERRY ST @ WINTHROP ST	0.3		0.5		13.8	1		0		4	0.5		1		5.2
10 - 5349 - FERRY ST @ BELMONT ST	2		0.2		15.6	1		0		5	0.5		1		4.7
11 - 5350 - FERRY ST @ BENNETT ST	1		0		16.6	1		0		6	0		0		4.7
12 - 5351 - FERRY ST @ CENTRAL AVE	2		0		18.6	2		0		8	0.5		1.5		3.7
13 - 5352 - FERRY ST @ GLENDALE ST	3		0.7		20.9	0		1		7	0.5		0		4.2
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.8		0		21.7	0		0		7	0		0		4.2
15 - 5354 - FERRY ST @ BROADWAY	3.3		4.5		20.5	3		0		10	2.5		3		3.7
16 - 5489 - BROADWAY @ WAVERLY AVE	1.2		0		21.7	0		0		10	0.3		0		4
17 - 5490 - BROADWAY @ RAYMOND ST	2.3		0.2		23.8	3		0		13	4.3		0		8.3
18 - 5492 - BROADWAY @ HANCOCK ST	3.3		1.2		25.9	4		0		17	3.8		0		12.1
19 - 5493 - BROADWAY @ PLEASANT ST	0.8		2.3		24.4	0		0		17	0.5		0.3		12.3
20 - 5494 - BROADWAY @ WEBSTER ST	2		0.2		26.2	0		0		17	1		0		13.3
21 - 5495 - BROADWAY @ CHURCH ST	0.2		0.3		26.1	2		0		19	1		0.5		13.8
22 - 5496 - BROADWAY @ NORWOOD ST	2.7		1.7		27.1	1		1		19	3.5		6.5		10.8
23 - 5559 - BROADWAY OPP SECOND ST	1.8		0.5		28.4	0		0		19	1		2		9.8
24 - 5560 - BROADWAY @ GLADSTONE ST	2		3.8		26.6	0		0		19	0		0		9.8
25 - 5497 - BROADWAY @ BOWDOIN ST	0.7		0.2		27.1	0		0		19	0.5		1.3		9
26 - 5498 - BROADWAY OPP BEACHAM ST	0.7		0.5		27.3	0		0		19	1.3		0.5		9.8
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0.5		27.8	0		0		19	1.5		1.8		9.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		27.8	0		0		19	0.8		0.3		10
29 - 5501 - OPP 173 ALFORD ST	0		0	1	26.8	0		0	1	18	0		0	0	10
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		26.8	0		0		18	0		0		10
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		26.8	0		0		18	0		0		10
32 - 5502 - ALFORD ST @ WEST ST	0		0.8		26	0		0		18	0		0		10
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		26.7		-0.7	0		18		0	0		1.3		8.7
Maximum					28.4					19					13.8
Total	50.2		50.7			22		22			31.8		23.1		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	08:04 (104.0) [7] !Fall 2012!					08:18 (104.0) [10] !Fall 2012!					08:33 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	3.1	0	0		3.1	5.8	1	0		6.8	3.5	1	0		4.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0.1		0		3.2	0.2		0.1		6.9	0		0		4.5
3 - 5342 - MAIN ST OPP PLEASANT ST	0.3		1.7		1.8	0.6		1		6.5	0		2.5		2
4 - 5343 - FERRY ST @ CENTRE ST	0		0		1.8	0.5		0.1		6.9	0		0		2
5 - 5344 - FERRY ST @ EASTERN AVE	0.4		0.6		1.6	0.1		0.1		6.9	0		0		2
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.3		0.3		1.6	0.2		0.4		6.7	0		0		2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.3		0.6		1.3	0.4		0		7.1	1		1.5		1.5
8 - 5347 - FERRY ST @ CROSS ST	0.3		1.1		0.5	0.2		0.6		6.7	0.5		0		2
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		0.5	0.4		0		7.1	0		0		2
10 - 5349 - FERRY ST @ BELMONT ST	0.3		0.6		0.2	1.2		0.3		8	0		0		2
11 - 5350 - FERRY ST @ BENNETT ST	0.1		1.3		-1	0.1		0.5		7.6	0		0		2
12 - 5351 - FERRY ST @ CENTRAL AVE	0.9		0		-0.1	0.4		0.2		7.8	0.5		0		2.5
13 - 5352 - FERRY ST @ GLENDALE ST	0		0		-0.1	0.7		0		8.5	2		0		4.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		-0.1	0.5		0.1		8.9	0.5		0		5
15 - 5354 - FERRY ST @ BROADWAY	1.1		1.1		-0.1	2.3		1.1		10.1	1.5		0		6.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		-0.1	0.9		0		11	0		0		6.5
17 - 5490 - BROADWAY @ RAYMOND ST	0		0.6		-0.7	1.4		0.2		12.2	0.5		1		6
18 - 5492 - BROADWAY @ HANCOCK ST	1.1		0		0.4	1		0.3		12.9	0.5		0		6.5
19 - 5493 - BROADWAY @ PLEASANT ST	0.4		0		0.8	0.4		1		12.3	0		1		5.5
20 - 5494 - BROADWAY @ WEBSTER ST	0.1		0		0.9	0.6		0.3		12.6	0.5		0		6
21 - 5495 - BROADWAY @ CHURCH ST	0		0		0.9	0.2		0.3		12.5	0		0		6
22 - 5496 - BROADWAY @ NORWOOD ST	1.6		4.9		-2.4	2.6		1.6		13.5	1.5		2		5.5
23 - 5559 - BROADWAY OPP SECOND ST	0.3		1.6		-3.7	1.1		0.4		14.2	0.5		3		3
24 - 5560 - BROADWAY @ GLADSTONE ST	0.4		1		-4.3	0.6		0.3		14.5	1		0		4
25 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0		-4	0.2		0.3		14.4	0		2		2
26 - 5498 - BROADWAY OPP BEACHAM ST	2.1		3.3		-5.2	0.3		0.2		14.5	0		1		1
27 - 5499 - BROADWAY OPP THORNDIKE ST	0.9		0		-4.3	0.5		0		15	1		0		2
28 - 5500 - BROADWAY @ HORIZON WAY	0.9		0		-3.4	0.4		0		15.4	1		0		3
29 - 5501 - OPP 173 ALFORD ST	0		0	0	-3.4	0		0	1	14.4	0		0	1	2
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		-3.4	0		0		14.4	0		0		2
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		-3.4	0		0		14.4	0		0		2
32 - 5502 - ALFORD ST @ WEST ST	0		0.3		-3.7	0		0.1		14.3	0		2		0
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		1		-4.7	0		15.2		-0.9	0		0		0
Maximum					3.2					15.4					6.5
Total	15.4		19.9			23.8		24.7			16		16		

Massachusetts Bay Transportation Authority
Route 104
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	09:00 (104.0) [1] !Fall 2012!					09:30 (104.0) [8] !Fall 2012!					10:00 (104.0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	4	2	0		6	4	2	0		6	11	2	0		13
2 - 5289 - CENTRE ST @ STOP & SHOP	1		4		3	0.9		0.4		6.5	1.5		0.3		14.2
3 - 5342 - MAIN ST OPP PLEASANT ST	3		9		-3	0.6		0.3		6.8	2		0.8		15.4
4 - 5343 - FERRY ST @ CENTRE ST	0		0		-3	0.1		0		6.9	0		0		15.4
5 - 5344 - FERRY ST @ EASTERN AVE	2		0		-1	0.3		0		7.2	0		0		15.4
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		0		-1	0.4		0.1		7.5	0.8		0.5		15.7
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1		0		0	0.3		0.3		7.5	0.5		0		16.2
8 - 5347 - FERRY ST @ CROSS ST	1		0		1	0.8		0.6		7.7	0		0		16.2
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		1	0.5		0.6		7.6	0		1.3		14.9
10 - 5349 - FERRY ST @ BELMONT ST	0		0		1	1.1		0.5		8.2	1.3		0.3		15.9
11 - 5350 - FERRY ST @ BENNETT ST	0		0		1	0.3		0.1		8.4	0.3		0		16.2
12 - 5351 - FERRY ST @ CENTRAL AVE	2		0		3	2.4		0.5		10.3	1.3		1		16.5
13 - 5352 - FERRY ST @ GLENDALE ST	1		0		4	1		0.1		11.2	0.8		0.8		16.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		4	1		0.5		11.7	0.3		1.3		15.5
15 - 5354 - FERRY ST @ BROADWAY	2		0		6	6.9		0.4		18.2	5.5		3.5		17.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		6	1		0		19.2	0.3		0		17.8
17 - 5490 - BROADWAY @ RAYMOND ST	0		0		6	1.5		0.1		20.6	4		1		20.8
18 - 5492 - BROADWAY @ HANCOCK ST	2		4		4	4		0.1		24.5	3.5		0.8		23.5
19 - 5493 - BROADWAY @ PLEASANT ST	0		9		-5	1.5		0.8		25.2	0.8		0		24.3
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		-5	1		0.1		26.1	0.5		1.3		23.5
21 - 5495 - BROADWAY @ CHURCH ST	0		0		-5	0.6		1		25.7	1.5		1.3		23.7
22 - 5496 - BROADWAY @ NORWOOD ST	0		0		-5	6.8		2.6		29.9	4.8		3.3		25.2
23 - 5559 - BROADWAY OPP SECOND ST	1		0		-4	2		0.1		31.8	0.5		0.3		25.4
24 - 5560 - BROADWAY @ GLADSTONE ST	3		0		-1	0.9		0.3		32.4	1.3		0.3		26.4
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		-1	0.8		0.1		33.1	0.5		0		26.9
26 - 5498 - BROADWAY OPP BEACHAM ST	3		0		2	0.8		0		33.9	1		0.5		27.4
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		3	0.9		0		34.8	2		0.8		28.6
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		3	0		0		34.8	0		0		28.6
29 - 5501 - OPP 173 ALFORD ST	0		0	2	1	0.1		0	2	32.9	0		0	2	26.6
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		1	0		0		32.9	0		0		26.6
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		1	0		0		32.9	0		0		26.6
32 - 5502 - ALFORD ST @ WEST ST	0		0		1	0		0.3		32.6	0		0		26.6
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		3		-2	0		34		-1.4	0		28		-1.4
Maximum					6					34.8					28.6
Total	27		29			42.1		43.9			45.5		46.8		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
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(Urban Transportation Associates)

	10:40 (104.0) [6] !Fall 2012!					11:20 (104.0) [5] !Fall 2012!					12:00 (104.0) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	8.7	3	0		11.7	11.2	6	0		17.2	11.5	4	0		15.5
2 - 5289 - CENTRE ST @ STOP & SHOP	2		0.5		13.2	3.6		0.8		20	3		0.8		17.7
3 - 5342 - MAIN ST OPP PLEASANT ST	2		0		15.2	2.4		0.2		22.2	8.8		1.5		25
4 - 5343 - FERRY ST @ CENTRE ST	0.2		0		15.4	0		0		22.2	0.3		0		25.3
5 - 5344 - FERRY ST @ EASTERN AVE	0.3		0.3		15.4	0.2		0		22.4	1.2		0.2		26.3
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.7		0.5		15.6	1.6		1.6		22.4	1.2		0.7		26.8
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.8		0.5		15.9	1.6		0.8		23.2	1		2		25.8
8 - 5347 - FERRY ST @ CROSS ST	1.2		1		16.1	1		0.8		23.4	0.7		1		25.5
9 - 5348 - FERRY ST @ WINTHROP ST	0.8		0.5		16.4	0.2		0.2		23.4	0.5		0.8		25.2
10 - 5349 - FERRY ST @ BELMONT ST	1.5		1.8		16.1	1.4		1.6		23.2	1.2		1.2		25.2
11 - 5350 - FERRY ST @ BENNETT ST	0.3		0		16.4	0		0		23.2	0.5		0		25.7
12 - 5351 - FERRY ST @ CENTRAL AVE	1.3		0.8		16.9	0.8		1		23	1		1.3		25.4
13 - 5352 - FERRY ST @ GLENDALE ST	0.5		0.3		17.1	1.2		0		24.2	3.5		0.7		28.2
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.2		0.7		16.6	0.2		0.6		23.8	0.3		0.7		27.8
15 - 5354 - FERRY ST @ BROADWAY	7.2		1.7		22.1	8		3.4		28.4	5		5.7		27.1
16 - 5489 - BROADWAY @ WAVERLY AVE	0.3		0.7		21.7	0.2		0		28.6	1.3		0.5		27.9
17 - 5490 - BROADWAY @ RAYMOND ST	4.7		0.2		26.2	2.2		1		29.8	4		1		30.9
18 - 5492 - BROADWAY @ HANCOCK ST	1.8		1.2		26.8	4.4		1.6		32.6	3		1		32.9
19 - 5493 - BROADWAY @ PLEASANT ST	1.7		0.3		28.2	1.2		1		32.8	1		0.5		33.4
20 - 5494 - BROADWAY @ WEBSTER ST	0.3		0.3		28.2	0.4		0.4		32.8	1		0.2		34.2
21 - 5495 - BROADWAY @ CHURCH ST	0.8		0.3		28.7	0.2		1.2		31.8	1.2		3.7		31.7
22 - 5496 - BROADWAY @ NORWOOD ST	9.8		3.3		35.2	6.6		4.4		34	6.2		3.2		34.7
23 - 5559 - BROADWAY OPP SECOND ST	3.3		0.7		37.8	1.2		0.4		34.8	2.5		0.8		36.4
24 - 5560 - BROADWAY @ GLADSTONE ST	2.3		0.3		39.8	2.2		0		37	2.2		0.3		38.3
25 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0.3		40	0.4		0.4		37	0.2		0		38.5
26 - 5498 - BROADWAY OPP BEACHAM ST	0.2		0.2		40	1		0.8		37.2	0.8		0.5		38.8
27 - 5499 - BROADWAY OPP THORNDIKE ST	0.2		0.5		39.7	1		0		38.2	1.2		0.7		39.3
28 - 5500 - BROADWAY @ HORIZON WAY	0.2		0		39.9	0		0		38.2	0		0		39.3
29 - 5501 - OPP 173 ALFORD ST	0		0	3	36.9	0		0	6	32.2	0		0	4	35.3
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		36.9	0		0		32.2	0		0		35.3
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0.2		36.7	0		0		32.2	0		0		35.3
32 - 5502 - ALFORD ST @ WEST ST	0.2		0.2		36.7	0		0		32.2	0		0.3		35
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		36		0.7	0		32.2		7.1E-15	0		35		7.1E-15
Maximum					40					38.2					39.3
Total	54		53.3			54.4		54.4			64.2		64.2		

Massachusetts Bay Transportation Authority
Route 104
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	12:40 (104.0) [5] !Fall 2012!					13:20 (104.0) [6] !Fall 2012!					14:00 (104.0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	16.4	3	0		19.4	13.8	7	0		20.8	22.6	3	0		25.6
2 - 5289 - CENTRE ST @ STOP & SHOP	3.4		0.6		22.2	3.3		0.2		23.9	2.6		0		28.2
3 - 5342 - MAIN ST OPP PLEASANT ST	3.2		1.6		23.8	5.7		0.7		28.9	9.2		1.6		35.8
4 - 5343 - FERRY ST @ CENTRE ST	0		0		23.8	0.5		0		29.4	1.6		0.4		37
5 - 5344 - FERRY ST @ EASTERN AVE	0.6		1.2		23.2	0.5		0.5		29.4	1.2		0.4		37.8
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		0.8		23.4	0.7		5		25.1	1.6		0.4		39
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.4		1.6		22.2	0.8		1.3		24.6	0.4		4		35.4
8 - 5347 - FERRY ST @ CROSS ST	0.2		0.4		22	0.3		2.8		22.1	0.2		0.4		35.2
9 - 5348 - FERRY ST @ WINTHROP ST	0.4		0.8		21.6	1.3		3.5		19.9	0		1.2		34
10 - 5349 - FERRY ST @ BELMONT ST	1.2		3.2		19.6	1.8		3.8		17.9	1.8		7.4		28.4
11 - 5350 - FERRY ST @ BENNETT ST	0.4		0		20	0.2		0.3		17.8	1		0.4		29
12 - 5351 - FERRY ST @ CENTRAL AVE	2		0.6		21.4	0.8		1.8		16.8	1.8		2.6		28.2
13 - 5352 - FERRY ST @ GLENDALE ST	2		1.2		22.2	2.7		2		17.5	2.4		4.8		25.8
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0.6		21.6	0.2		0.5		17.2	0		4.4		21.4
15 - 5354 - FERRY ST @ BROADWAY	2.8		4.2		20.2	5.8		12.3		10.7	5.4		9.2		17.6
16 - 5489 - BROADWAY @ WAVERLY AVE	0.6		0.4		20.4	1.3		0.8		11.2	0.8		0.6		17.8
17 - 5490 - BROADWAY @ RAYMOND ST	1.2		1.2		20.4	3.7		2.3		12.6	2.6		2.6		17.8
18 - 5492 - BROADWAY @ HANCOCK ST	2.6		1		22	3.3		3.8		12.1	3.6		1		20.4
19 - 5493 - BROADWAY @ PLEASANT ST	1		1		22	0.8		0		12.9	1		2.2		19.2
20 - 5494 - BROADWAY @ WEBSTER ST	0		0.2		21.8	0.5		0.3		13.1	0		1.8		17.4
21 - 5495 - BROADWAY @ CHURCH ST	1.2		1.8		21.2	1.2		4.7		9.6	0.4		1.8		16
22 - 5496 - BROADWAY @ NORWOOD ST	7.4		2.4		26.2	9.8		6.5		12.9	6.2		12.2		10
23 - 5559 - BROADWAY OPP SECOND ST	2		1.4		26.8	2		0.8		14.1	2.4		1.8		10.6
24 - 5560 - BROADWAY @ GLADSTONE ST	2.6		0		29.4	2		3.5		12.6	6.8		1.2		16.2
25 - 5497 - BROADWAY @ BOWDOIN ST	0.4		0.2		29.6	0.5		0.3		12.8	0.2		0		16.4
26 - 5498 - BROADWAY OPP BEACHAM ST	0.6		0		30.2	0.7		4.3		9.2	0.4		1.6		15.2
27 - 5499 - BROADWAY OPP THORNDIKE ST	2.6		0.8		32	1.3		0		10.5	0.4		10.4		5.2
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		32	0		0.8		9.7	0.6		0		5.8
29 - 5501 - OPP 173 ALFORD ST	0.2		0	3	29.2	0		0	7	2.7	0		0	3	2.8
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		29.2	0		0		2.7	0		0		2.8
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		29.2	0		0		2.7	0		0		2.8
32 - 5502 - ALFORD ST @ WEST ST	0		0.2		29	0		2.2		0.5	0		1		1.8
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		29		-3.6E-15	0		0.8		-0.3	0		2.2		-0.4
Maximum					32					29.4					39
Total	56.4		56.4			65.7		66.2			77.2		77.6		

Massachusetts Bay Transportation Authority
Route 104
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Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	Trip (RouteVar) [Observations]														
	14:25 (104.0) [1] !Fall 2012!					14:45 (104.0) [13] !Fall 2012!					15:05 (104.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	17	3	0		20	22.3	4	0		26.3	32.5	4	0		36.5
2 - 5289 - CENTRE ST @ STOP & SHOP	3		0		23	3.1		0.2		29.2	4		0		40.5
3 - 5342 - MAIN ST OPP PLEASANT ST	0		0		23	2		0.5		30.7	5.5		0		46
4 - 5343 - FERRY ST @ CENTRE ST	0		0		23	1.1		0.2		31.6	0		0.5		45.5
5 - 5344 - FERRY ST @ EASTERN AVE	0		1		22	0.6		0		32.2	0.5		0.5		45.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		0		23	0.5		3.2		29.5	0.5		6		40
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1		1		23	0.7		1.3		28.9	0.5		4		36.5
8 - 5347 - FERRY ST @ CROSS ST	0		1		22	0		1.5		27.4	0		1		35.5
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		22	0.1		1.8		25.7	0		3		32.5
10 - 5349 - FERRY ST @ BELMONT ST	0		0		22	0.4		4		22.1	0.5		1		32
11 - 5350 - FERRY ST @ BENNETT ST	0		4		18	0.2		0.5		21.8	0.5		0.5		32
12 - 5351 - FERRY ST @ CENTRAL AVE	0		2		16	1.5		0.9		22.4	2		1.5		32.5
13 - 5352 - FERRY ST @ GLENDALE ST	0		0		16	0.5		1.5		21.4	0.5		2.5		30.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		1		15	0		0.7		20.7	0.5		0		31
15 - 5354 - FERRY ST @ BROADWAY	2		4		13	4.9		3.2		22.4	2.5		7		26.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		1		12	1.2		0.5		23.1	0		0		26.5
17 - 5490 - BROADWAY @ RAYMOND ST	1		0		13	3.2		0.9		25.4	1		2		25.5
18 - 5492 - BROADWAY @ HANCOCK ST	0		1		12	3.2		1.2		27.4	1.5		1.5		25.5
19 - 5493 - BROADWAY @ PLEASANT ST	0		0		12	0.8		0.3		27.9	0.5		1		25
20 - 5494 - BROADWAY @ WEBSTER ST	2		0		14	0.2		0.5		27.6	0		0		25
21 - 5495 - BROADWAY @ CHURCH ST	0		0		14	0.5		1		27.1	0		1.5		23.5
22 - 5496 - BROADWAY @ NORWOOD ST	1		0		15	6.8		2.5		31.4	0.5		2.5		21.5
23 - 5559 - BROADWAY OPP SECOND ST	1		0		16	1.3		0.4		32.3	2		2.5		21
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0		16	1.6		1		32.9	0		1		20
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		16	2.2		0.2		34.9	0		0		20
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		16	0.4		0.3		35	0.5		1.5		19
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		16	0.9		0.2		35.7	0.5		1		18.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		16	0.2		0.2		35.7	0		0		18.5
29 - 5501 - OPP 173 ALFORD ST	0		0	3	13	0.1		0	4	31.8	0		0	4	14.5
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		13	0		0		31.8	0		0		14.5
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		13	0		0		31.8	0		0		14.5
32 - 5502 - ALFORD ST @ WEST ST	0		0		13	0		0		31.8	0		0		14.5
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		13		0	0		31.9		-0.1	0		14.5		0
Maximum					23					35.7					46
Total	29		29			60.5		60.5			56.5		56.5		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	15:25 (104.0) [9] !Fall 2012!					15:42 (104.0) [2] !Spring 2013!					16:05 (104.0) [17] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	19.4	3	0		22.4	23.5	3	0		26.5	22.7	0	0		22.7
2 - 5289 - CENTRE ST @ STOP & SHOP	2.2		0.6		24	4		0.5		30	1.7		0.4		24
3 - 5342 - MAIN ST OPP PLEASANT ST	3.1		0.7		26.4	0		0		30	3.1		0.1		27
4 - 5343 - FERRY ST @ CENTRE ST	0.6		0		27	0		0		30	0.3		0		27.3
5 - 5344 - FERRY ST @ EASTERN AVE	0.7		0.4		27.3	1		3		28	1.2		0.2		28.3
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.2		1.1		26.4	0		1.5		26.5	0.5		2.8		26
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.2		2.7		23.9	0		3.5		23	0.4		1.7		24.7
8 - 5347 - FERRY ST @ CROSS ST	1.1		1.2		23.8	0.5		1		22.5	0.6		2.7		22.6
9 - 5348 - FERRY ST @ WINTHROP ST	0.1		2.1		21.8	0.5		4.5		18.5	0.5		2.6		20.5
10 - 5349 - FERRY ST @ BELMONT ST	0.9		2.6		20.1	1		4		15.5	0.5		2.7		18.3
11 - 5350 - FERRY ST @ BENNETT ST	0		0.1		20	0		0		15.5	0.5		2		16.8
12 - 5351 - FERRY ST @ CENTRAL AVE	0.7		2.2		18.5	1		2		14.5	1.4		1.5		16.7
13 - 5352 - FERRY ST @ GLENDALE ST	0.2		0.6		18.1	0		1		13.5	0.8		2.2		15.3
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.2		0.3		18	0.5		0.5		13.5	0.2		0.6		14.9
15 - 5354 - FERRY ST @ BROADWAY	3.1		4		17.1	3		3.5		13	3.6		3.6		14.9
16 - 5489 - BROADWAY @ WAVERLY AVE	1.4		0.3		18.2	1.5		0		14.5	0.6		0.5		15
17 - 5490 - BROADWAY @ RAYMOND ST	1		1.1		18.1	1.5		1.5		14.5	2.5		0.6		16.9
18 - 5492 - BROADWAY @ HANCOCK ST	2.8		1		19.9	0.5		0		15	1.8		0.8		17.9
19 - 5493 - BROADWAY @ PLEASANT ST	1.7		1.2		20.4	1		0.5		15.5	0.4		0.8		17.5
20 - 5494 - BROADWAY @ WEBSTER ST	0.7		0.3		20.8	0.5		0		16	0.2		0.8		16.9
21 - 5495 - BROADWAY @ CHURCH ST	0.9		1.1		20.6	0.5		1		15.5	0.7		1.4		16.2
22 - 5496 - BROADWAY @ NORWOOD ST	5.8		2.8		23.6	5.5		2		19	3.2		2.3		17.1
23 - 5559 - BROADWAY OPP SECOND ST	1.4		0.2		24.8	5		0		24	1.4		0.2		18.3
24 - 5560 - BROADWAY @ GLADSTONE ST	2.2		0.2		26.8	0.5		0		24.5	0.8		0.2		18.9
25 - 5497 - BROADWAY @ BOWDOIN ST	0.4		0.6		26.6	0.5		0		25	0.4		0.4		18.9
26 - 5498 - BROADWAY OPP BEACHAM ST	1.4		0.1		27.9	0.5		1.5		24	0.4		0.8		18.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	0.1		0		28	0.5		0.5		24	0.3		0.1		18.7
28 - 5500 - BROADWAY @ HORIZON WAY	0.1		0		28.1	0		0		24	0.4		0		19.1
29 - 5501 - OPP 173 ALFORD ST	0		0	3	25.1	0		0	3	21	0		0	0	19.1
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		25.1	0		0		21	0		0		19.1
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		25.1	0		0		21	0		0.2		18.9
32 - 5502 - ALFORD ST @ WEST ST	0		0		25.1	0		0		21	0		0.1		18.8
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		25.2		-0.1	0		21		0	0		19.3		-0.5
Maximum					28.1					30					28.3
Total	52.8		52.8			53		53			51.3		51.6		

Massachusetts Bay Transportation Authority
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	16:27 (104.0) [1] !Fall 2012!					16:44 (104.0) [8] !Fall 2012!					16:59 (104.0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	22	0	0		22	20.5	0	0		20.5	28	0	0		28
2 - 5289 - CENTRE ST @ STOP & SHOP	2		0		24	5.8		1.1		25.2	0.9		1.1		27.8
3 - 5342 - MAIN ST OPP PLEASANT ST	0		5		19	2.9		0		28.1	3.1		0.4		30.5
4 - 5343 - FERRY ST @ CENTRE ST	0		0		19	0.6		0.3		28.4	0.1		0.1		30.5
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		19	0.5		0.1		28.8	0.3		0.6		30.2
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		1		18	0.8		2.4		27.2	1		3		28.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		2		16	0.1		3.4		23.9	0.5		3.1		25.6
8 - 5347 - FERRY ST @ CROSS ST	0		1		15	0.8		2.8		21.9	0.3		2.1		23.8
9 - 5348 - FERRY ST @ WINTHROP ST	0		2		13	0.1		2.1		19.9	0.1		2.1		21.8
10 - 5349 - FERRY ST @ BELMONT ST	0		0		13	0.4		4.8		15.5	0.5		3.5		18.8
11 - 5350 - FERRY ST @ BENNETT ST	0		1		12	0.1		1.4		14.2	0		2.3		16.5
12 - 5351 - FERRY ST @ CENTRAL AVE	0		1		11	1.6		2.9		12.9	0.6		1.1		16
13 - 5352 - FERRY ST @ GLENDALE ST	6		1		16	0.5		2.6		10.8	0.6		1.8		14.8
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		2		14	0		1		9.8	0		1.3		13.5
15 - 5354 - FERRY ST @ BROADWAY	1		2		13	2.1		7.5		4.4	1.6		3.4		11.7
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		13	0.5		0.4		4.5	0.8		0.3		12.2
17 - 5490 - BROADWAY @ RAYMOND ST	1		0		14	1		1.3		4.2	1.4		1.4		12.2
18 - 5492 - BROADWAY @ HANCOCK ST	0		0		14	1		0.8		4.4	1.3		1.9		11.6
19 - 5493 - BROADWAY @ PLEASANT ST	0		2		12	0.4		0.9		3.9	0.6		0		12.2
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		12	0		0.6		3.3	0.3		0.4		12.1
21 - 5495 - BROADWAY @ CHURCH ST	0		0		12	0.4		0.6		3.1	0.3		1.1		11.3
22 - 5496 - BROADWAY @ NORWOOD ST	0		9		3	1.3		5.8		-1.4	1.4		0.5		12.2
23 - 5559 - BROADWAY OPP SECOND ST	0		0		3	0.8		0.4		-1	0.8		0.5		12.5
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0		3	0.9		1.1		-1.2	0.5		1.3		11.7
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		3	0.8		0		-0.4	1.1		0.5		12.3
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		3	1		0.6		-1.4E-15	0.1		0.5		11.9
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		3	1.3		1		0.3	0.5		0.5		11.9
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		3	0		0.1		0.2	0		0		11.9
29 - 5501 - OPP 173 ALFORD ST	0		0	0	3	0		0	0	0.2	0		0	0	11.9
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		3	0		0		0.2	0		0		11.9
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		3	0.8		0.9		0.1	0		0		11.9
32 - 5502 - ALFORD ST @ WEST ST	0		0		3	0		0		0.1	0		0		11.9
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		6		-3	0		0		0.1	0		11.9		-3.6E-15
Maximum					24					28.8					30.5
Total	32		35			46.6		46.6			46.5		46.5		

Massachusetts Bay Transportation Authority
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	17:14 (104.0) [1] !Fall 2012!					17:29 (104.0) [2] !Fall 2012!					17:44 (104.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	23	0	0		23	25.3	0	0		25.3	27	0	0		27
2 - 5289 - CENTRE ST @ STOP & SHOP	2		1		24	3.7		1.3		27.7	1.3		0.7		27.6
3 - 5342 - MAIN ST OPP PLEASANT ST	5		1		28	1.7		0.3		29.1	2.7		0		30.3
4 - 5343 - FERRY ST @ CENTRE ST	0		0		28	0		0		29.1	0		0		30.3
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		28	0.5		0.5		29.1	0		1.7		28.6
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		6		22	1		10.5		19.6	0.3		3		25.9
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0		22	0.5		3.5		16.6	0		2		23.9
8 - 5347 - FERRY ST @ CROSS ST	0		1		21	1		3		14.6	0		1.3		22.6
9 - 5348 - FERRY ST @ WINTHROP ST	0		4		17	0		5		9.6	0		2.3		20.3
10 - 5349 - FERRY ST @ BELMONT ST	4		6		15	0		7		2.6	1.3		3		18.6
11 - 5350 - FERRY ST @ BENNETT ST	0		1		14	1.5		7		-2.9	0		2.7		15.9
12 - 5351 - FERRY ST @ CENTRAL AVE	0		2		12	0		4		-6.9	0.7		3		13.6
13 - 5352 - FERRY ST @ GLENDALE ST	0		2		10	1		5		-10.9	0		4		9.6
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		10	0		2		-12.9	0		0		9.6
15 - 5354 - FERRY ST @ BROADWAY	4		2		12	3		9		-18.9	1.7		4		7.3
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		12	1		3		-20.9	0		0		7.3
17 - 5490 - BROADWAY @ RAYMOND ST	0		0		12	2		2		-20.9	0		0		7.3
18 - 5492 - BROADWAY @ HANCOCK ST	0		2		10	3		6		-23.9	1.3		0		8.6
19 - 5493 - BROADWAY @ PLEASANT ST	1		0		11	4		2		-21.9	0		0		8.6
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		11	0		0		-21.9	0		0		8.6
21 - 5495 - BROADWAY @ CHURCH ST	0		0		11	0		0		-21.9	0		0		8.6
22 - 5496 - BROADWAY @ NORWOOD ST	2		16		-3	4.5		0		-17.4	1.7		5		5.3
23 - 5559 - BROADWAY OPP SECOND ST	3		0		0	3		1.5		-15.9	0		0.7		4.6
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0		0	1.5		3		-17.4	0		0		4.6
25 - 5497 - BROADWAY @ BOWDOIN ST	4		0		4	2.5		1.5		-16.4	0		0.7		3.9
26 - 5498 - BROADWAY OPP BEACHAM ST	1		6		-1	0		3		-19.4	0		0		3.9
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		0	0.5		1.5		-20.4	0		0		3.9
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		0	0		0		-20.4	0		0		3.9
29 - 5501 - OPP 173 ALFORD ST	0		0	0	0	0		0	0	-20.4	0		0	0	3.9
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		0	0		0		-20.4	0		0		3.9
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		0	0		0		-20.4	0		0		3.9
32 - 5502 - ALFORD ST @ WEST ST	0		0		0	1.5		1		-19.9	0		0		3.9
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0		0	0		1.5		-21.4	0		4		-0.1
Maximum					28					29.1					30.3
Total	50		50			62.7		84.2			38		38		

Massachusetts Bay Transportation Authority
Route 104
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Fall 2012
(Urban Transportation Associates)

	17:59 (104.0) [1] !Fall 2012!					18:15 (104.0) [8] !Fall 2012!					18:25 (104.0) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	9	0	0		9	23.9	3	0		26.9	17.1	2	0		19.1
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		9	2.3		1		28.2	1.1		0.3		19.9
3 - 5342 - MAIN ST OPP PLEASANT ST	2		1		10	1.1		0.5		28.8	0.3		0.6		19.6
4 - 5343 - FERRY ST @ CENTRE ST	0		0		10	1.5		0.1		30.2	0.1		0.3		19.4
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		10	0		0.8		29.4	0		0.4		19
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		1		10	0.9		4		26.3	0.1		5.1		14
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		1		9	0.1		3		23.4	0		1.7		12.3
8 - 5347 - FERRY ST @ CROSS ST	0		1		8	0.5		3.1		20.8	0		2.9		9.4
9 - 5348 - FERRY ST @ WINTHROP ST	1		1		8	0.1		2.4		18.5	0		1.3		8.1
10 - 5349 - FERRY ST @ BELMONT ST	0		0		8	0.9		2.6		16.8	0		2.1		6
11 - 5350 - FERRY ST @ BENNETT ST	0		0		8	0.1		1.1		15.8	0.4		0		6.4
12 - 5351 - FERRY ST @ CENTRAL AVE	0		0		8	0.4		2		14.2	0.1		1.1		5.4
13 - 5352 - FERRY ST @ GLENDALE ST	0		2		6	0.1		2.4		11.9	0.1		1.4		4.1
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		6	0		0.4		11.5	0		0.9		3.2
15 - 5354 - FERRY ST @ BROADWAY	1		6		1	1		2.6		9.9	2.1		1.9		3.4
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		1	0.3		0.3		9.9	0.6		0.1		3.9
17 - 5490 - BROADWAY @ RAYMOND ST	0		0		1	0.4		0.5		9.8	1		0.6		4.3
18 - 5492 - BROADWAY @ HANCOCK ST	0		1		0	0.6		1		9.4	0.7		1.6		3.4
19 - 5493 - BROADWAY @ PLEASANT ST	0		0		0	0		0		9.4	0.3		0		3.7
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		0	0.1		0.4		9.1	0.3		0.3		3.7
21 - 5495 - BROADWAY @ CHURCH ST	0		0		0	0		0.8		8.3	0		0.7		3
22 - 5496 - BROADWAY @ NORWOOD ST	0		0		0	1		0.4		8.9	0.4		1.1		2.3
23 - 5559 - BROADWAY OPP SECOND ST	1		1		0	0.8		0.3		9.4	0.7		0		3
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0		0	0		0.4		9	0.1		0.7		2.4
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		0	0.4		0.1		9.3	0.1		0.3		2.2
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		0	0.1		0.1		9.3	0.3		0		2.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		0	0		0		9.3	0.1		0.3		2.3
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		0	0		0		9.3	0		0.3		2
29 - 5501 - OPP 173 ALFORD ST	0		0	0	0	0		0	3	6.3	0		0	2	7.1E-15
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		0	0		0		6.3	0		0		7.1E-15
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		0	0		0		6.3	0		0		7.1E-15
32 - 5502 - ALFORD ST @ WEST ST	0		0		0	0		0		6.3	0		0.4		-0.4
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		3		-3	0		6.6		-0.3	0		0		-0.4
Maximum					10					30.2					19.9
Total	15		18			36.5		36.8			26.4		26.4		

Massachusetts Bay Transportation Authority
Route 104
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(Urban Transportation Associates)

Seq - StopID - Stop Name	18:50 (104.0) [1] !Fall 2012!					19:05 (104.0) [11] !Fall 2012!					19:20 (104.0) [9] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	13.5	2	0		15.5	21.7	4	0		25.7	18.8	4	0		22.8
2 - 5289 - CENTRE ST @ STOP & SHOP	1		0		16.5	1.6		0.8		26.5	1.6		0.6		23.8
3 - 5342 - MAIN ST OPP PLEASANT ST	3		0		19.5	1.8		0.4		27.9	1.1		0.7		24.2
4 - 5343 - FERRY ST @ CENTRE ST	0		0		19.5	0.2		0.3		27.8	0.2		0.6		23.8
5 - 5344 - FERRY ST @ EASTERN AVE	1		0		20.5	0		0.4		27.4	0.3		0		24.1
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		1		20.5	0.1		1.9		25.6	0.3		2.7		21.7
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0		20.5	0		2.7		22.9	0.3		2.7		19.3
8 - 5347 - FERRY ST @ CROSS ST	3		1		22.5	0.3		3.4		19.8	1.2		0.9		19.6
9 - 5348 - FERRY ST @ WINTHROP ST	0		4		18.5	0.3		1.2		18.9	0		1.3		18.3
10 - 5349 - FERRY ST @ BELMONT ST	0		5		13.5	0.5		2.8		16.6	0.6		1.7		17.2
11 - 5350 - FERRY ST @ BENNETT ST	0		1		12.5	0		0.3		16.3	0.2		0		17.4
12 - 5351 - FERRY ST @ CENTRAL AVE	0		7		5.5	0		1.5		14.8	0		0.4		17
13 - 5352 - FERRY ST @ GLENDALE ST	0		2		3.5	0		0.6		14.2	0.2		1.6		15.6
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		2		1.5	0		0.3		13.9	0.1		0.2		15.5
15 - 5354 - FERRY ST @ BROADWAY	2		6		-2.5	0.5		2.5		11.9	0.7		2.7		13.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		-2.5	0.4		0.1		12.2	0.7		0		14.2
17 - 5490 - BROADWAY @ RAYMOND ST	0		4		-6.5	0.2		0		12.4	0.4		1.3		13.3
18 - 5492 - BROADWAY @ HANCOCK ST	0		3		-9.5	0.3		1.4		11.3	0.3		0.8		12.8
19 - 5493 - BROADWAY @ PLEASANT ST	0		0		-9.5	0.6		0.3		11.6	0.1		0		12.9
20 - 5494 - BROADWAY @ WEBSTER ST	0		3		-12.5	0.2		0.5		11.3	0.1		1		12
21 - 5495 - BROADWAY @ CHURCH ST	0		0		-12.5	0.1		0.4		11	0.1		0.1		12
22 - 5496 - BROADWAY @ NORWOOD ST	0		0		-12.5	0.4		1.2		10.2	1.2		1.6		11.6
23 - 5559 - BROADWAY OPP SECOND ST	0		0		-12.5	0.5		0.4		10.3	0.3		0.2		11.7
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0		-12.5	0.3		0.4		10.2	0.9		0		12.6
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		-12.5	0		0		10.2	0		0.3		12.3
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		-12.5	0.1		0.3		10	0		0.6		11.7
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		-12.5	0		0		10	0.1		0		11.8
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		-12.5	0		0		10	0.1		0		11.9
29 - 5501 - OPP 173 ALFORD ST	0		0	2	-14.5	0		0	4	6	0		0	4	7.9
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		-14.5	0		0		6	0		0		7.9
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		-14.5	0		0		6	0		0		7.9
32 - 5502 - ALFORD ST @ WEST ST	0		0		-14.5	0		0		6	0		0.1		7.8
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0		-14.5	0		6		5.3E-15	0		8.2		-0.4
Maximum					22.5					27.9					24.2
Total	24.5		39			29.8		29.8			30.1		30.1		

Massachusetts Bay Transportation Authority
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	19:45 (104.0) [3] !Fall 2012!					20:40 (104.0) [5] !Fall 2012!					21:40 (104.0) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	28.7	4	0		32.7	20.2	8	0		28.2	17.7	11	0		28.7
2 - 5289 - CENTRE ST @ STOP & SHOP	2		1		33.7	2.4		0.2		30.4	2.6		0.4		30.9
3 - 5342 - MAIN ST OPP PLEASANT ST	1.3		1		34	2		0.6		31.8	1.1		0.3		31.7
4 - 5343 - FERRY ST @ CENTRE ST	0		0		34	0.2		0.2		31.8	0		0		31.7
5 - 5344 - FERRY ST @ EASTERN AVE	0.7		0.7		34	1		1.2		31.6	0.3		0.4		31.6
6 - 5345 - FERRY ST OPP ELMWOOD PK	1.3		6		29.3	1.8		4		29.4	0.2		1.5		30.3
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0.3		29	0.6		1.4		28.6	0.5		1.6		29.2
8 - 5347 - FERRY ST @ CROSS ST	1.7		8		22.7	0		1.8		26.8	0.5		1.4		28.3
9 - 5348 - FERRY ST @ WINTHROP ST	0		3.3		19.4	0.2		1.6		25.4	0.3		1.9		26.7
10 - 5349 - FERRY ST @ BELMONT ST	0.3		2.7		17	1		2.2		24.2	0.8		2.3		25.2
11 - 5350 - FERRY ST @ BENNETT ST	0		0.3		16.7	0		0.4		23.8	0.2		0.4		25
12 - 5351 - FERRY ST @ CENTRAL AVE	0		1		15.7	0.2		1.4		22.6	0.2		1.4		23.8
13 - 5352 - FERRY ST @ GLENDALE ST	0		1.3		14.4	0.6		1		22.2	0.3		0.6		23.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		14.4	0		0.4		21.8	0		0.4		23.1
15 - 5354 - FERRY ST @ BROADWAY	0.3		7		7.7	0.8		3.2		19.4	3.1		2.8		23.4
16 - 5489 - BROADWAY @ WAVERLY AVE	0.7		0.3		8.1	0		1.2		18.2	0.2		0.2		23.4
17 - 5490 - BROADWAY @ RAYMOND ST	1.3		0		9.4	2		0.4		19.8	1.9		0.4		24.9
18 - 5492 - BROADWAY @ HANCOCK ST	0.7		1.3		8.8	1.8		1.6		20	1.9		0.6		26.2
19 - 5493 - BROADWAY @ PLEASANT ST	0		1.7		7.1	0.4		0		20.4	0.6		0.4		26.4
20 - 5494 - BROADWAY @ WEBSTER ST	0		1.3		5.8	0		0.4		20	0.3		0.1		26.6
21 - 5495 - BROADWAY @ CHURCH ST	0		0		5.8	0		1.2		18.8	0.6		1		26.2
22 - 5496 - BROADWAY @ NORWOOD ST	0.7		1.3		5.2	2.6		0.4		21	4.2		1.7		28.7
23 - 5559 - BROADWAY OPP SECOND ST	0		0		5.2	0.8		0.6		21.2	1.3		0		30
24 - 5560 - BROADWAY @ GLADSTONE ST	0.3		0.7		4.8	0.8		0		22	1.4		0.4		31
25 - 5497 - BROADWAY @ BOWDOIN ST	1		0		5.8	0		0.6		21.4	0.3		0.1		31.2
26 - 5498 - BROADWAY OPP BEACHAM ST	0		1		4.8	0		0.4		21	0.7		0.9		31
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0.7		4.1	0		0.2		20.8	1.1		0.6		31.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		4.1	0		0		20.8	0.1		0		31.6
29 - 5501 - OPP 173 ALFORD ST	0		0	4	0.1	0		0	8	12.8	0		0	11	20.6
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		0.1	0		0		12.8	0		0		20.6
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		0.1	0		0		12.8	0		0		20.6
32 - 5502 - ALFORD ST @ WEST ST	0		0		0.1	0		0		12.8	0		0		20.6
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0		0.1	0		12.8		1.1E-14	0		20.5		0.1
Maximum					34					31.8					31.7
Total	41		41			39.4		39.4			42.3		42.3		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	22:40 (104.0) [10] !Fall 2012!					23:40 (104.0) [7] !Fall 2012!					24:41 (104.0) [14] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	8	9	0		17	16.1	8	0		24.1	8.2	7	0		15.2
2 - 5289 - CENTRE ST @ STOP & SHOP	0.3		0		17.3	1.6		0		25.7	0.2		0		15.4
3 - 5342 - MAIN ST OPP PLEASANT ST	0.1		0.1		17.3	0.3		0		26	0		0		15.4
4 - 5343 - FERRY ST @ CENTRE ST	0.1		0		17.4	0		0		26	0		0.1		15.3
5 - 5344 - FERRY ST @ EASTERN AVE	0.1		0.1		17.4	0.1		0.3		25.8	0.1		0		15.4
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.9		1.7		16.6	0.1		1.7		24.2	0		0.1		15.3
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.4		1.4		15.6	0		1.6		22.6	0		0.7		14.6
8 - 5347 - FERRY ST @ CROSS ST	0.4		1.1		14.9	0		3.9		18.7	0		0.4		14.2
9 - 5348 - FERRY ST @ WINTHROP ST	0.2		0.9		14.2	0.1		1.4		17.4	0		0.5		13.7
10 - 5349 - FERRY ST @ BELMONT ST	0.2		0.7		13.7	0.1		1.7		15.8	0.4		0.5		13.6
11 - 5350 - FERRY ST @ BENNETT ST	0.1		0.5		13.3	0		0.1		15.7	0		0.2		13.4
12 - 5351 - FERRY ST @ CENTRAL AVE	0.5		0.8		13	0		0.4		15.3	0.2		0.4		13.2
13 - 5352 - FERRY ST @ GLENDALE ST	0.2		0.3		12.9	0		1.4		13.9	0.1		0.5		12.8
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		12.9	0		0.3		13.6	0		0.1		12.7
15 - 5354 - FERRY ST @ BROADWAY	0.6		1		12.5	0.3		1.9		12	0.8		1.5		12
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0.4		12.1	0		0.1		11.9	0		0.2		11.8
17 - 5490 - BROADWAY @ RAYMOND ST	1.2		0.4		12.9	0.6		0.1		12.4	0		0.6		11.2
18 - 5492 - BROADWAY @ HANCOCK ST	0.6		0.4		13.1	0.3		0.7		12	0		0.3		10.9
19 - 5493 - BROADWAY @ PLEASANT ST	0.5		0.2		13.4	0.1		0.4		11.7	0		0.8		10.1
20 - 5494 - BROADWAY @ WEBSTER ST	0.1		0		13.5	0.1		0.1		11.7	0		0.2		9.9
21 - 5495 - BROADWAY @ CHURCH ST	0.1		0.3		13.3	0		0		11.7	0		0.5		9.4
22 - 5496 - BROADWAY @ NORWOOD ST	1.8		0.2		14.9	1.3		0.7		12.3	0.5		0.5		9.4
23 - 5559 - BROADWAY OPP SECOND ST	1.1		0.1		15.9	0.9		0.1		13.1	0.7		0		10.1
24 - 5560 - BROADWAY @ GLADSTONE ST	0.3		0.1		16.1	0		0		13.1	0		0		10.1
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0.2		15.9	0		0		13.1	0.1		0.1		10.1
26 - 5498 - BROADWAY OPP BEACHAM ST	0.1		0.2		15.8	0		0		13.1	0		0		10.1
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		1.3		14.5	0		0.3		12.8	0		0		10.1
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		14.5	0		0		12.8	0		0		10.1
29 - 5501 - OPP 173 ALFORD ST	0		0	9	5.5	0		0	8	4.8	0		0	7	3.1
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		5.5	0		0		4.8	0		0		3.1
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		5.5	0		0		4.8	0		0		3.1
32 - 5502 - ALFORD ST @ WEST ST	0		0		5.5	0		0		4.8	0		0		3.1
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		9.3		-3.8	0		4.9		-0.1	0		3.9		-0.8
Maximum					17.4					26					15.4
Total	18		21.7			22.1		22.3			11.2		11.9		

Massachusetts Bay Transportation Authority
Route 104
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Seq - StopID - Stop Name	Total		
	On	Off	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	644.4	0	761.4
2 - 5289 - CENTRE ST @ STOP & SHOP	72.9	19.6	814.7
3 - 5342 - MAIN ST OPP PLEASANT ST	93.9	35.7	872.9
4 - 5343 - FERRY ST @ CENTRE ST	8.9	4.4	877.4
5 - 5344 - FERRY ST @ EASTERN AVE	19.6	19.1	877.9
6 - 5345 - FERRY ST OPP ELMWOOD PK	24.3	84	818.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	21.7	64.8	775.1
8 - 5347 - FERRY ST @ CROSS ST	24	61.2	737.9
9 - 5348 - FERRY ST @ WINTHROP ST	14	62.8	689.1
10 - 5349 - FERRY ST @ BELMONT ST	42.1	86.5	644.7
11 - 5350 - FERRY ST @ BENNETT ST	15.2	29.4	630.5
12 - 5351 - FERRY ST @ CENTRAL AVE	48.3	53.4	625.4
13 - 5352 - FERRY ST @ GLENDALE ST	52	51.1	626.3
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	7.1	24	609.4
15 - 5354 - FERRY ST @ BROADWAY	136.6	148.8	597.2
16 - 5489 - BROADWAY @ WAVERLY AVE	30.7	12.1	615.8
17 - 5490 - BROADWAY @ RAYMOND ST	85.8	31.2	670.4
18 - 5492 - BROADWAY @ HANCOCK ST	97.6	46.5	721.5
19 - 5493 - BROADWAY @ PLEASANT ST	33.5	42.3	712.7
20 - 5494 - BROADWAY @ WEBSTER ST	23	16.6	719.1
21 - 5495 - BROADWAY @ CHURCH ST	19.4	29.6	708.9
22 - 5496 - BROADWAY @ NORWOOD ST	151.3	123	737.2
23 - 5559 - BROADWAY OPP SECOND ST	57.8	26.9	768.1
24 - 5560 - BROADWAY @ GLADSTONE ST	53.2	27.3	794
25 - 5497 - BROADWAY @ BOWDOIN ST	26.2	13.4	806.8
26 - 5498 - BROADWAY OPP BEACHAM ST	24.9	34.8	796.9
27 - 5499 - BROADWAY OPP THORNDIKE ST	36.4	23.9	809.4
28 - 5500 - BROADWAY @ HORIZON WAY	7	1.7	814.7
29 - 5501 - OPP 173 ALFORD ST	0.4	0	698.1
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0	0.1	698
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0.8	1.3	697.5
32 - 5502 - ALFORD ST @ WEST ST	1.7	12.1	687.1
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0	743.3	-56.2
Maximum	0	0	1292.4
Total	1872.2	1928.2	0

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	05:30 (104.0) [4] !Fall 2012!					05:50 (104.0) [3] !Fall 2012!					06:15 (104.0) [11] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	1.8		0		1.8	11		0		11	11.4		0		11.4
2 - 5504 - ALFORD ST @ MAIN ST	0		0		1.8	0		0		11	0		0		11.4
3 - 5505 - 173 ALFORD ST	0	0	0		1.8	0	0	0		11	0	0	0.1		11.3
4 - 5506 - BROADWAY @ DEXTER ST	0		0		1.8	0		0.7		10.3	0		1		10.3
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0.5		1.3	0		1		9.3	0		1.4		8.9
6 - 5508 - BROADWAY @ LANGDON ST	0.5		0.3		1.5	0		1.3		8	0.5		1.7		7.7
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.5		0		2	0.3		0.3		8	0.2		0.4		7.5
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0		2	0		0.7		7.3	0.5		0.1		7.9
9 - 5695 - BROADWAY @ EVERETT SQ	0.5		0		2.5	0.3		0.3		7.3	0.8		1.9		6.8
10 - 5510 - BROADWAY @ MANSFIELD ST	1.3		0		3.8	0.3		0.3		7.3	2.2		0.3		8.7
11 - 5511 - BROADWAY @ SUMMER ST	0.8		0		4.6	1		2		6.3	0.6		1		8.3
12 - 5513 - BROADWAY @ HIGH ST	0		0		4.6	2.7		0		9	0.8		0.5		8.6
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0		4.6	0		0		9	0.1		0.6		8.1
14 - 5517 - BROADWAY @ REED AVE	0.3		0		4.9	0.3		0.3		9	3.1		0.6		10.6
15 - 5518 - BROADWAY @ FERRY ST	2.5		0.3		7.1	4.3		1.3		12	7.3		2.3		15.6
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0		7.1	0.3		0		12.3	0.4		0		16
17 - 5356 - FERRY ST @ SHUTE ST	1.5		0		8.6	4		0		16.3	3.7		0		19.7
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1.3		0		9.9	0.7		0.7		16.3	2.8		0.1		22.4
19 - 5358 - FERRY ST @ COOLIDGE ST	2.3		0		12.2	0.7		0		17	0.5		0.1		22.8
20 - 5359 - FERRY ST @ RICH ST	2		0		14.2	5.7		0.3		22.4	5.3		0.2		27.9
21 - 5360 - FERRY ST @ HARVARD ST	2.8		0		17	0.7		0		23.1	2.8		0.5		30.2
22 - 5361 - FERRY ST @ CROSS ST	1.3		0		18.3	4.3		0.3		27.1	3.5		0		33.7
23 - 5362 - FERRY ST @ MAGNOLIA ST	1		1.3		18	2.3		0		29.4	3		0		36.7
24 - 5363 - FERRY ST @ HOLYOKE ST	1.5		0.3		19.2	5		0.3		34.1	7		0.4		43.3
25 - 5364 - FERRY ST @ EASTERN AVE	0.3		0.5		19	0.3		0.3		34.1	0		0.6		42.7
26 - 5365 - EASTERN AVE @ MAIN ST	0.5		0		19.5	0		0		34.1	0.4		0.6		42.5
27 - 5366 - MAIN ST @ CENTRE ST	0		0		19.5	0		0.3		33.8	0.1		0.4		42.2
28 - 5342 - MAIN ST OPP PLEASANT ST	0.5		0		20	0.7		0		34.5	0.5		1		41.7
29 - 9215 - MAIN ST @ SALEM ST	0.3		0.5		19.8	0		0		34.5	0		0		41.7
30 - 19215 - FLORENCE ST @ RAMSDELL RD	1.8		0.3		21.3	0.7		0		35.2	1.7		0		43.4
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		21.3	0.3		0		35.5	0		0		43.4
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		20.8	0	0.5	0		35.3	0	0.2	0		43.3	0	0.1
Maximum					21.3					35.5					43.4
Total	24.8		24.5		21.3	46		46		35.5	59		59		43.4
		0		0			0		0			0		0	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:35 (104.0) [4] !Fall 2012!					06:49 (104.0) [6] !Fall 2012!					07:03 (104.0) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	9.8		0		9.8	13.3		0		13.3	8.9		0		8.9
2 - 5504 - ALFORD ST @ MAIN ST	0		0		9.8	0.3		0		13.6	0.1		0		9
3 - 5505 - 173 ALFORD ST	0	1	0		10.8	0	1	0		14.6	0	1	0		10
4 - 5506 - BROADWAY @ DEXTER ST	0		0.3		10.5	0		0.5		14.1	0		0.2		9.8
5 - 5507 - BROADWAY @ THORNDIKE ST	2		0.8		11.7	0.5		0.7		13.9	0.5		1.5		8.8
6 - 5508 - BROADWAY @ LANGDON ST	1		2.5		10.2	0.7		5.7		8.9	0.5		0.4		8.9
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		10.2	0		0		8.9	0.6		0		9.5
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0.8		9.4	0		0.2		8.7	1.1		0.9		9.7
9 - 5695 - BROADWAY @ EVERETT SQ	1		2.3		8.1	0.8		3		6.5	1.3		0.7		10.3
10 - 5510 - BROADWAY @ MANSFIELD ST	0.3		0.5		7.9	0.5		0.5		6.5	2		0.5		11.8
11 - 5511 - BROADWAY @ SUMMER ST	1.3		1.3		7.9	1		0.3		7.2	1.1		1.8		11.1
12 - 5513 - BROADWAY @ HIGH ST	0.3		0		8.2	1.8		1		8	1.5		0.5		12.1
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0		8.2	0		0		8	0.4		0		12.5
14 - 5517 - BROADWAY @ REED AVE	0.5		0		8.7	2		0.5		9.5	2.9		0.4		15
15 - 5518 - BROADWAY @ FERRY ST	4.8		0.8		12.7	8.3		1.5		16.3	7		3.9		18.1
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	2.5		0.3		14.9	0.8		0		17.1	2.4		0		20.5
17 - 5356 - FERRY ST @ SHUTE ST	4.8		0.3		19.4	4		0		21.1	6.5		0.1		26.9
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	2		0.8		20.6	2.8		0		23.9	4.1		1		30
19 - 5358 - FERRY ST @ COOLIDGE ST	0.3		0		20.9	3.3		0		27.2	3.1		0.4		32.7
20 - 5359 - FERRY ST @ RICH ST	3.3		0.3		23.9	3.2		0		30.4	6.3		0.5		38.5
21 - 5360 - FERRY ST @ HARVARD ST	5.5		0		29.4	5.3		0.2		35.5	3.4		0		41.9
22 - 5361 - FERRY ST @ CROSS ST	7		0		36.4	7.2		0.2		42.5	4.5		0.5		45.9
23 - 5362 - FERRY ST @ MAGNOLIA ST	4.5		0		40.9	3.7		0.3		45.9	2.3		0.4		47.8
24 - 5363 - FERRY ST @ HOLYOKE ST	3.8		1.3		43.4	3.5		0.5		48.9	1.5		0		49.3
25 - 5364 - FERRY ST @ EASTERN AVE	0		0.5		42.9	0		0.2		48.7	0.1		0.3		49.1
26 - 5365 - EASTERN AVE @ MAIN ST	0.8		0		43.7	0.3		0.3		48.7	0.2		0.5		48.8
27 - 5366 - MAIN ST @ CENTRE ST	0		0		43.7	0.3		0		49	0		0.1		48.7
28 - 5342 - MAIN ST OPP PLEASANT ST	0.3		1.5		42.5	1		2.8		47.2	0.5		2.7		46.5
29 - 9215 - MAIN ST @ SALEM ST	0.3		0		42.8	0		0		47.2	0.5		0		47
30 - 19215 - FLORENCE ST @ RAMSDELL RD	2		0.3		44.5	0.8		0.3		47.7	1.4		0.5		47.9
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		44.5	0		0		47.7	0		0		47.9
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		43.5	1	-7.1E-15	0		46.5	1	0.2	0		46.2	1	0.7
Maximum					44.5					49					49.3
Total	57.5		57.5		44.5	65.7		65.2		49	64.4		63.8		49.3
		1		1			1		1			1		1	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	07:17 (104.0) [3] !Fall 2012!					07:31 (104.0) [7] !Fall 2012!					07:45 (104.0) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	10.7		0		10.7	5		0		5	10		0		10
2 - 5504 - ALFORD ST @ MAIN ST	0		0		10.7	0		0		5	0		0		10
3 - 5505 - 173 ALFORD ST	0	0	0		10.7	0	1	0		6	0	0	0		10
4 - 5506 - BROADWAY @ DEXTER ST	0		0		10.7	0		0		6	0		0.1		9.9
5 - 5507 - BROADWAY @ THORNDIKE ST	4.3		1		14	7.3		0.7		12.6	1.4		0.5		10.8
6 - 5508 - BROADWAY @ LANGDON ST	0		1.3		12.7	0.4		0.4		12.6	0.7		0.7		10.8
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.7		0.3		13.1	1.9		0		14.5	0.1		0.2		10.7
8 - 5565 - BROADWAY @ GLADSTONE ST	0.3		3.3		10.1	2		3.4		13.1	1.8		1.4		11.1
9 - 5695 - BROADWAY @ EVERETT SQ	1.7		0.7		11.1	5.3		0.4		18	1.8		0.8		12.1
10 - 5510 - BROADWAY @ MANSFIELD ST	0.3		0		11.4	1		0.3		18.7	0.1		0.2		12
11 - 5511 - BROADWAY @ SUMMER ST	0.3		0.3		11.4	2.6		1.7		19.6	1.5		1.6		11.9
12 - 5513 - BROADWAY @ HIGH ST	1.3		1		11.7	2.7		1.3		21	2		1.6		12.3
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0.7		11	0.6		0.3		21.3	0.9		0.4		12.8
14 - 5517 - BROADWAY @ REED AVE	0.7		1.7		10	0.4		0.3		21.4	1.2		0.6		13.4
15 - 5518 - BROADWAY @ FERRY ST	4		3.3		10.7	5.3		9.3		17.4	5.3		4.5		14.2
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1.7		0.3		12.1	0.6		0.1		17.9	0.3		0.1		14.4
17 - 5356 - FERRY ST @ SHUTE ST	2.7		0		14.8	6.3		0		24.2	4.8		0.3		18.9
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	3.3		0.7		17.4	3		0.3		26.9	5.1		0.3		23.7
19 - 5358 - FERRY ST @ COOLIDGE ST	1.3		0.7		18	0.1		0		27	0.8		0		24.5
20 - 5359 - FERRY ST @ RICH ST	2.7		0		20.7	3.1		0.1		30	5		0.5		29
21 - 5360 - FERRY ST @ HARVARD ST	2.7		0		23.4	1.3		0.1		31.2	2		0		31
22 - 5361 - FERRY ST @ CROSS ST	3.3		0.7		26	3		0.4		33.8	5.9		0.2		36.7
23 - 5362 - FERRY ST @ MAGNOLIA ST	2.7		0		28.7	5.4		0		39.2	4.4		0.1		41
24 - 5363 - FERRY ST @ HOLYOKE ST	1.3		0		30	0.9		0		40.1	4		0.2		44.8
25 - 5364 - FERRY ST @ EASTERN AVE	0.3		0		30.3	0.7		0.1		40.7	0.4		0.4		44.8
26 - 5365 - EASTERN AVE @ MAIN ST	0.7		0.7		30.3	0.7		0.4		41	0.2		0.8		44.2
27 - 5366 - MAIN ST @ CENTRE ST	0		0		30.3	0.3		0		41.3	0.2		0.2		44.2
28 - 5342 - MAIN ST OPP PLEASANT ST	0		2.3		28	0.6		1.1		40.8	0.7		1.4		43.5
29 - 9215 - MAIN ST @ SALEM ST	0		0		28	0.9		1.6		40.1	0.1		1		42.6
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		28	3.3		0.4		43	1.9		1.3		43.2
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		28	0.3		0		43.3	0		0		43.2
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		28	0	0	0		37.4	1	4.9	0		42.3	0	0.9
Maximum					30.3					43.3					44.8
Total	47		47		30.3	64.9		60.4		43.3	62.6		61.7		44.8
		0		0			1		1			0		0	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	07:59 (104.0) [8] !Fall 2012!					08:13 (104.0) [8] !Fall 2012!					08:27 (104.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	7.4		0		7.4	6.4		0		6.4	3		0		3
2 - 5504 - ALFORD ST @ MAIN ST	0		0		7.4	0		0		6.4	0		0		3
3 - 5505 - 173 ALFORD ST	0	0	0		7.4	0	2	0		8.4	0	1	0		4
4 - 5506 - BROADWAY @ DEXTER ST	0		0		7.4	0		0.5		7.9	0		0		4
5 - 5507 - BROADWAY @ THORNDIKE ST	0.4		0.5		7.3	0.6		0		8.5	0		1		3
6 - 5508 - BROADWAY @ LANGDON ST	0.6		0.3		7.6	0.6		0		9.1	0		1		2
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		7.6	0.3		0		9.4	1		0		3
8 - 5565 - BROADWAY @ GLADSTONE ST	1.6		1.6		7.6	0.8		0.6		9.6	0		0		3
9 - 5695 - BROADWAY @ EVERETT SQ	1.8		1.4		8	0.8		1.5		8.9	2		1.5		3.5
10 - 5510 - BROADWAY @ MANSFIELD ST	1.1		0.3		8.8	0.5		1		8.4	2		0		5.5
11 - 5511 - BROADWAY @ SUMMER ST	2.1		0.4		10.5	0.5		0.3		8.6	0.5		0		6
12 - 5513 - BROADWAY @ HIGH ST	3		0.3		13.2	2.8		0.6		10.8	0		0		6
13 - 5514 - BROADWAY @ LEXINGTON ST	0.6		0.5		13.3	0.6		0.3		11.1	0		0.5		5.5
14 - 5517 - BROADWAY @ REED AVE	2		0.6		14.7	1.4		0.1		12.4	0.5		0.5		5.5
15 - 5518 - BROADWAY @ FERRY ST	9.5		1.9		22.3	5.6		2.3		15.7	3.5		0.5		8.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.8		0.5		22.6	1.5		0		17.2	1.5		0		10
17 - 5356 - FERRY ST @ SHUTE ST	6.1		0		28.7	4.8		0.1		21.9	0.5		0		10.5
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	3.6		0.5		31.8	2.6		0		24.5	0		0.5		10
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0.1		31.7	0.5		0.5		24.5	0.5		0		10.5
20 - 5359 - FERRY ST @ RICH ST	3.6		0.1		35.2	4.5		0.4		28.6	1		0		11.5
21 - 5360 - FERRY ST @ HARVARD ST	2.1		0.1		37.2	2.3		0		30.9	0.5		0		12
22 - 5361 - FERRY ST @ CROSS ST	3.5		0		40.7	2		0.1		32.8	3.5		0.5		15
23 - 5362 - FERRY ST @ MAGNOLIA ST	3.1		0		43.8	3.9		0.1		36.6	2.5		0		17.5
24 - 5363 - FERRY ST @ HOLYOKE ST	2.3		0.1		46	2.4		0.6		38.4	7.5		0		25
25 - 5364 - FERRY ST @ EASTERN AVE	0		0.1		45.9	0.4		0		38.8	0		0.5		24.5
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.1		45.8	0.4		0.1		39.1	0		0		24.5
27 - 5366 - MAIN ST @ CENTRE ST	0.1		0.4		45.5	0		0		39.1	0		0		24.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0.3		3.9		41.9	0.4		1.5		38	0		3.5		21
29 - 9215 - MAIN ST @ SALEM ST	0.6		3.9		38.6	0.7		1		37.7	1		1.5		20.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.6		0		39.2	1.9		0		39.6	2		0		22.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0.3		0		39.5	0.1		0.3		39.4	0		0.5		22
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		39.4	0	0.1	0		39.4	2	-2	0		20.5	1	0.5
Maximum					46					39.6					25
Total	57.1		56.9		46	49		51.3		39.6	33		32.5		25
		0		0			2		2			1		1	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	08:41 (104.0) [12] !Fall 2012!					09:00 (104.0) [8] !Fall 2012!					09:30 (104.0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	8		0		8	10		0		10	11		0		11
2 - 5504 - ALFORD ST @ MAIN ST	0		0		8	0.1		0		10.1	0		0		11
3 - 5505 - 173 ALFORD ST	0	1	0		9	0	4	0		14.1	0	4	0		15
4 - 5506 - BROADWAY @ DEXTER ST	0		0		9	0		0.1		14	0		0.2		14.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0.3		0.7		8.6	0		0.6		13.4	0.8		0.8		14.8
6 - 5508 - BROADWAY @ LANGDON ST	0.2		0.2		8.6	0.4		0.3		13.5	0.8		0		15.6
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.4		0		9	0		0.4		13.1	0		0		15.6
8 - 5565 - BROADWAY @ GLADSTONE ST	0.8		0.6		9.2	0.4		0.3		13.2	0.4		0.6		15.4
9 - 5695 - BROADWAY @ EVERETT SQ	1.1		2.1		8.2	2.8		0.8		15.2	5		3		17.4
10 - 5510 - BROADWAY @ MANSFIELD ST	0.7		1		7.9	1.1		1.3		15	1.4		1		17.8
11 - 5511 - BROADWAY @ SUMMER ST	0.4		0.3		8	1.1		0.6		15.5	1.2		0.8		18.2
12 - 5513 - BROADWAY @ HIGH ST	0.3		0.7		7.6	0.6		0.6		15.5	3.2		1.4		20
13 - 5514 - BROADWAY @ LEXINGTON ST	0.6		0.2		8	0.3		1.5		14.3	1		0.4		20.6
14 - 5517 - BROADWAY @ REED AVE	2		0.2		9.8	1.5		0.5		15.3	0.2		0.2		20.6
15 - 5518 - BROADWAY @ FERRY ST	3.6		1.2		12.2	3.5		1.9		16.9	4.8		3.6		21.8
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.5		0.4		12.3	2		0.9		18	3.6		0.8		24.6
17 - 5356 - FERRY ST @ SHUTE ST	3.3		0.2		15.4	2.9		0.3		20.6	1.2		0.8		25
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1.8		0.3		16.9	3.3		0.3		23.6	1.8		0.6		26.2
19 - 5358 - FERRY ST @ COOLIDGE ST	0.6		0		17.5	0.9		0.1		24.4	0		0		26.2
20 - 5359 - FERRY ST @ RICH ST	3.3		0.3		20.5	4.6		0.5		28.5	3.8		1		29
21 - 5360 - FERRY ST @ HARVARD ST	2.2		0.7		22	1.8		0		30.3	2.2		0.6		30.6
22 - 5361 - FERRY ST @ CROSS ST	2.7		0.1		24.6	2		0		32.3	1.8		0.6		31.8
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.9		0.1		25.4	4.1		0		36.4	2.4		0.2		34
24 - 5363 - FERRY ST @ HOLYOKE ST	5.8		0.2		31	2.4		0.3		38.5	4.6		0		38.6
25 - 5364 - FERRY ST @ EASTERN AVE	0.1		0.2		30.9	0.1		0		38.6	0		1.2		37.4
26 - 5365 - EASTERN AVE @ MAIN ST	0.2		0.2		30.9	0		0.1		38.5	0		0.4		37
27 - 5366 - MAIN ST @ CENTRE ST	0.2		0.6		30.5	0		1		37.5	0.2		1.8		35.4
28 - 5342 - MAIN ST OPP PLEASANT ST	0.4		2.6		28.3	0		1		36.5	1.6		4.6		32.4
29 - 9215 - MAIN ST @ SALEM ST	0		0.3		28	0.4		0.8		36.1	0.2		0.4		32.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	2.3		0.2		30.1	1.5		0.9		36.7	0.2		1.4		31
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.1		30	0		0.1		36.6	0.4		0.6		30.8
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		29.5	1	-0.5	0		31	4	1.6	0		25.8	4	1
Maximum					31					38.6					38.6
Total	42.5		42.5		31	47.6		45.9		38.6	53.8		52.8		38.6
		1		1			4		4			4		4	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	10:00 (104.0) [6] !Fall 2012!					10:40 (104.0) [4] !Fall 2012!					11:20 (104.0) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	15.2		0		15.2	20.2		0		20.2	16.8		0		16.8
2 - 5504 - ALFORD ST @ MAIN ST	0.2		0		15.4	0		0		20.2	0.4		0.5		16.7
3 - 5505 - 173 ALFORD ST	0	4	0		19.4	0	4	0		24.2	0	7	0		23.7
4 - 5506 - BROADWAY @ DEXTER ST	0		1		18.4	0		0		24.2	0		0.3		23.4
5 - 5507 - BROADWAY @ THORNDIKE ST	1.5		0.2		19.7	1.3		1		24.5	0.5		0		23.9
6 - 5508 - BROADWAY @ LANGDON ST	0.3		0.3		19.7	0.5		1.5		23.5	0.3		0.8		23.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.5		19.5	0		0.5		23	0		0.5		22.9
8 - 5565 - BROADWAY @ GLADSTONE ST	0.5		1		19	0.3		1.5		21.8	0.8		1.7		22
9 - 5695 - BROADWAY @ EVERETT SQ	3.7		2		20.7	2.8		4.5		20.1	3.3		4.5		20.8
10 - 5510 - BROADWAY @ MANSFIELD ST	2		1.3		21.4	2		2		20.1	2		1.7		21.1
11 - 5511 - BROADWAY @ SUMMER ST	1.2		0.8		21.8	0.8		0.3		20.6	0.7		1.2		20.6
12 - 5513 - BROADWAY @ HIGH ST	1.3		1		22.1	1.8		2.8		19.6	1.7		1.5		20.8
13 - 5514 - BROADWAY @ LEXINGTON ST	0.5		2		20.6	0.5		1.5		18.6	0.7		1.5		20
14 - 5517 - BROADWAY @ REED AVE	1.8		2.2		20.2	0.3		0.5		18.4	1.2		1.2		20
15 - 5518 - BROADWAY @ FERRY ST	4.7		4.5		20.4	3		6.3		15.1	5.8		6.5		19.3
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1		1.2		20.2	1.5		1.3		15.3	1.5		0.3		20.5
17 - 5356 - FERRY ST @ SHUTE ST	0.8		0.7		20.3	2		0		17.3	2		1.3		21.2
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1		0.7		20.6	0.5		0.3		17.5	1.2		1		21.4
19 - 5358 - FERRY ST @ COOLIDGE ST	1.7		0.2		22.1	0.8		0		18.3	0		0		21.4
20 - 5359 - FERRY ST @ RICH ST	2		0.8		23.3	2		0.8		19.5	1.8		0.2		23
21 - 5360 - FERRY ST @ HARVARD ST	1.7		0.2		24.8	3		0		22.5	0.5		0.3		23.2
22 - 5361 - FERRY ST @ CROSS ST	1.3		0		26.1	0.5		0.5		22.5	0.2		0.3		23.1
23 - 5362 - FERRY ST @ MAGNOLIA ST	1.2		0.2		27.1	0.8		0.3		23	1.8		0		24.9
24 - 5363 - FERRY ST @ HOLYOKE ST	1.5		0.7		27.9	1		0.8		23.2	1.8		0.2		26.5
25 - 5364 - FERRY ST @ EASTERN AVE	0.2		0.3		27.8	0.5		0		23.7	0.2		0.7		26
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.5		27.3	0		0		23.7	0.3		0.5		25.8
27 - 5366 - MAIN ST @ CENTRE ST	0		1.7		25.6	0		0.4		23.3	0		3.7		22.1
28 - 5342 - MAIN ST OPP PLEASANT ST	0		4.2		21.4	0		3		20.3	0.5		2.5		20.1
29 - 9215 - MAIN ST @ SALEM ST	0.2		0.5		21.1	0		0		20.3	0		2.2		17.9
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		2		19.1	0.8		0		21.1	0.2		0		18.1
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		19.1	0		0		21.1	0		0		18.1
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		15.2	4	-0.1	0		17.6	4	-0.5	0		16.8	7	-5.7
Maximum					27.9					24.5					26.5
Total	45.7		45.7		27.9	46.5		47		24.5	46.1		51.8		26.5
		4		4			4		4			7		7	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	12:00 (104.0) [5] !Fall 2012!					12:40 (104.0) [6] !Fall 2012!					13:20 (104.0) [5] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	28.8		0		28.8	26.8		0		26.8	34.4		0		34.4
2 - 5504 - ALFORD ST @ MAIN ST	0		0		28.8	0		0		26.8	0.4		0		34.8
3 - 5505 - 173 ALFORD ST	0	4	0		32.8	0	4	0		30.8	0	7	0		41.8
4 - 5506 - BROADWAY @ DEXTER ST	0		0		32.8	0		0		30.8	0		0		41.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0.8		1.4		32.2	0.8		1		30.6	1		0.6		42.2
6 - 5508 - BROADWAY @ LANGDON ST	0.2		0.8		31.6	0.2		0		30.8	1		0.4		42.8
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		31.6	0.2		0		31	0.2		0.4		42.6
8 - 5565 - BROADWAY @ GLADSTONE ST	0.2		1		30.8	1.3		1		31.3	1		1.6		42
9 - 5695 - BROADWAY @ EVERETT SQ	2.4		3.4		29.8	3.3		6.5		28.1	4.8		7		39.8
10 - 5510 - BROADWAY @ MANSFIELD ST	1.6		1.4		30	1		2.2		26.9	3.2		2.2		40.8
11 - 5511 - BROADWAY @ SUMMER ST	1.2		1.4		29.8	0.3		1		26.2	3.8		3		41.6
12 - 5513 - BROADWAY @ HIGH ST	1.4		2.6		28.6	0.3		1.3		25.2	1		3.4		39.2
13 - 5514 - BROADWAY @ LEXINGTON ST	0.2		2		26.8	0.2		2.2		23.2	0.6		3		36.8
14 - 5517 - BROADWAY @ REED AVE	0.6		2.2		25.2	0.7		1.3		22.6	1.2		1.8		36.2
15 - 5518 - BROADWAY @ FERRY ST	5.2		7.4		23	4.2		6.7		20.1	5		6.4		34.8
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.4		0.4		23	0.7		0.2		20.6	2		0.6		36.2
17 - 5356 - FERRY ST @ SHUTE ST	3.6		1.6		25	3.3		1		22.9	1.6		1		36.8
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1		0.8		25.2	1.7		0.3		24.3	1.2		1		37
19 - 5358 - FERRY ST @ COOLIDGE ST	0.4		0.2		25.4	0		0.2		24.1	0.2		0.8		36.4
20 - 5359 - FERRY ST @ RICH ST	1.6		0.4		26.6	1.3		0.3		25.1	3.4		1.6		38.2
21 - 5360 - FERRY ST @ HARVARD ST	2.4		0		29	0.7		0.5		25.3	0		0.2		38
22 - 5361 - FERRY ST @ CROSS ST	0.6		0.4		29.2	1		0.8		25.5	1.4		1		38.4
23 - 5362 - FERRY ST @ MAGNOLIA ST	2.6		0.2		31.6	2		0.7		26.8	2		0.4		40
24 - 5363 - FERRY ST @ HOLYOKE ST	2.8		0.2		34.2	0.3		0.3		26.8	1.2		1		40.2
25 - 5364 - FERRY ST @ EASTERN AVE	0.4		1.8		32.8	0.2		1		26	0.8		0.6		40.4
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.8		32	0		0.5		25.5	0		0		40.4
27 - 5366 - MAIN ST @ CENTRE ST	0		1.3		30.7	0		1		24.5	0.2		1.8		38.8
28 - 5342 - MAIN ST OPP PLEASANT ST	0.3		3.8		27.2	1.5		6.3		19.7	0.8		5.2		34.4
29 - 9215 - MAIN ST @ SALEM ST	0		0.6		26.6	0		0.7		19	0.2		0.4		34.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.6		0.8		26.4	0.3		1.3		18	0.8		0.8		34.2
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0.4		0		26.8	0.2		0.5		17.7	0		0.4		33.8
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		24	4	-1.2	0		13.2	4	0.5	0		26.4	7	0.4
Maximum					34.2					31.3					42.8
Total	59.7		60.8		34.2	52.5		52		31.3	73.4		73		42.8
		4		4			4		4			7		7	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	14:00 (104.0) [13] !Fall 2012!					14:30 (104.0) [6] !Fall 2012!					14:50 (104.0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	28.7		0		28.7	25.2		0		25.2	25.8		0		25.8
2 - 5504 - ALFORD ST @ MAIN ST	0.5		0.1		29.1	0.2		0		25.4	0		0		25.8
3 - 5505 - 173 ALFORD ST	0	3	0		32.1	0	2	0		27.4	0	2	0		27.8
4 - 5506 - BROADWAY @ DEXTER ST	0		0.2		31.9	0		0.2		27.2	0		0.3		27.5
5 - 5507 - BROADWAY @ THORNDIKE ST	0.5		1.1		31.3	0.2		0.8		26.6	0		0.9		26.6
6 - 5508 - BROADWAY @ LANGDON ST	0.5		0.4		31.4	0.2		0		26.8	0.3		0.8		26.1
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0.4		31.1	0		0		26.8	0.1		0.1		26.1
8 - 5565 - BROADWAY @ GLADSTONE ST	1.3		1.7		30.7	1.8		1.3		27.3	1.1		0.8		26.4
9 - 5695 - BROADWAY @ EVERETT SQ	3.8		2.5		32	1.8		4.5		24.6	3.3		5		24.7
10 - 5510 - BROADWAY @ MANSFIELD ST	2.2		1.2		33	1.7		1.2		25.1	1.5		1.9		24.3
11 - 5511 - BROADWAY @ SUMMER ST	0.5		1.7		31.8	0.2		0.8		24.5	2.3		0.9		25.7
12 - 5513 - BROADWAY @ HIGH ST	0.5		3.8		28.5	0.3		2		22.8	0.5		2.6		23.6
13 - 5514 - BROADWAY @ LEXINGTON ST	0.5		2.8		26.2	0		1.7		21.1	0.3		3.5		20.4
14 - 5517 - BROADWAY @ REED AVE	0.5		1.1		25.6	0.3		2.8		18.6	0.1		1.5		19
15 - 5518 - BROADWAY @ FERRY ST	4.7		6.2		24.1	5.2		7.2		16.6	2.6		7.1		14.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1.5		0.8		24.8	2		1		17.6	1.3		0.1		15.7
17 - 5356 - FERRY ST @ SHUTE ST	1.5		1.3		25	2.5		1		19.1	2.1		0.8		17
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1.2		1.5		24.7	1.8		1.5		19.4	1		1.3		16.7
19 - 5358 - FERRY ST @ COOLIDGE ST	0.3		0.2		24.8	0.7		0		20.1	0.1		0.3		16.5
20 - 5359 - FERRY ST @ RICH ST	0.8		1		24.6	1.2		0.3		21	1.1		0.3		17.3
21 - 5360 - FERRY ST @ HARVARD ST	1.2		0.2		25.6	0.8		0.3		21.5	2		1		18.3
22 - 5361 - FERRY ST @ CROSS ST	0.6		0.4		25.8	0.8		1		21.3	1.3		0.8		18.8
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.5		0.4		25.9	0.2		0.3		21.2	2.8		0.8		20.8
24 - 5363 - FERRY ST @ HOLYOKE ST	1		0.7		26.2	1.3		1		21.5	0.4		0.1		21.1
25 - 5364 - FERRY ST @ EASTERN AVE	0		0.5		25.7	0		0.2		21.3	0.5		0.1		21.5
26 - 5365 - EASTERN AVE @ MAIN ST	0.1		0.8		25	0		1		20.3	0		1		20.5
27 - 5366 - MAIN ST @ CENTRE ST	0.2		0.8		24.4	0		1		19.3	0		1.3		19.2
28 - 5342 - MAIN ST OPP PLEASANT ST	1		3.1		22.3	0.7		1.7		18.3	0.4		4		15.6
29 - 9215 - MAIN ST @ SALEM ST	0.7		0.6		22.4	0.8		0.3		18.8	0		0.1		15.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.8		0.5		22.7	0.3		2.2		16.9	0.3		0.8		15
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.7		22	0.2		0		17.1	0		0		15
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		19.4	3	-0.4	0		15	2	0.1	0		17.6	2	-4.6
Maximum					33					27.4					27.8
Total	55.8		55.8		33	50.3		50.3		27.4	50.9		55.3		27.8
		3		3			2		2			2		2	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	15:10 (104.0) [2] !Fall 2012!					15:30 (104.0) [17] !Fall 2012!					15:50 (104.0) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	40		0		40	24.1		0		24.1	32.3		0		32.3
2 - 5504 - ALFORD ST @ MAIN ST	0.5		0		40.5	0.9		0		25	0.4		0		32.7
3 - 5505 - 173 ALFORD ST	0	3	0		43.5	0	2	0		27	0	2	0		34.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0		43.5	0		0		27	0		0.1		34.6
5 - 5507 - BROADWAY @ THORNDIKE ST	0		1		42.5	0.1		0.9		26.2	0.8		0.5		34.9
6 - 5508 - BROADWAY @ LANGDON ST	0		0		42.5	0.2		0.3		26.1	0		0.3		34.6
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.5		42	0.1		0.4		25.8	0.5		0.1		35
8 - 5565 - BROADWAY @ GLADSTONE ST	0.5		0.5		42	0.4		1.8		24.4	1.1		1.5		34.6
9 - 5695 - BROADWAY @ EVERETT SQ	2		5.5		38.5	3		3.9		23.5	3.1		6.3		31.4
10 - 5510 - BROADWAY @ MANSFIELD ST	0.5		1		38	2.3		2.2		23.6	1.1		1.6		30.9
11 - 5511 - BROADWAY @ SUMMER ST	0.5		2		36.5	4		1.3		26.3	2.4		1		32.3
12 - 5513 - BROADWAY @ HIGH ST	0		3.5		33	1.5		1.8		26	0.5		2		30.8
13 - 5514 - BROADWAY @ LEXINGTON ST	0		2		31	0.6		2.1		24.5	0.4		3.1		28.1
14 - 5517 - BROADWAY @ REED AVE	0		2		29	0.5		1.4		23.6	0.3		2.9		25.5
15 - 5518 - BROADWAY @ FERRY ST	3		8		24	4.1		4.9		22.8	3.3		8.9		19.9
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1.5		0		25.5	0.8		0.2		23.4	0.5		0		20.4
17 - 5356 - FERRY ST @ SHUTE ST	1		2		24.5	1.1		1.4		23.1	1.4		1.8		20
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1.5		3.5		22.5	1.6		1.4		23.3	3.4		1.4		22
19 - 5358 - FERRY ST @ COOLIDGE ST	0		2		20.5	0.1		0.8		22.6	0.3		0.3		22
20 - 5359 - FERRY ST @ RICH ST	1		0		21.5	0.8		2.1		21.3	0.5		1.3		21.2
21 - 5360 - FERRY ST @ HARVARD ST	0.5		0		22	0.4		0.6		21.1	0.3		0.4		21.1
22 - 5361 - FERRY ST @ CROSS ST	1		0		23	1.1		0.8		21.4	1		0.4		21.7
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0		23	3.6		1.4		23.6	0.3		0.1		21.9
24 - 5363 - FERRY ST @ HOLYOKE ST	0.5		0		23.5	1.1		0.9		23.8	1.4		0.5		22.8
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		23.5	0.1		0.6		23.3	0.1		0.5		22.4
26 - 5365 - EASTERN AVE @ MAIN ST	0		1		22.5	0.2		0.6		22.9	0		0.1		22.3
27 - 5366 - MAIN ST @ CENTRE ST	0		1.5		21	0.1		1.5		21.5	0.1		1.5		20.9
28 - 5342 - MAIN ST OPP PLEASANT ST	0.5		3		18.5	0.6		4		18.1	0		1.9		19
29 - 9215 - MAIN ST @ SALEM ST	1.5		0.5		19.5	0.1		0.5		17.7	0.1		1.4		17.7
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		19.5	0.2		0.9		17	0.3		0.4		17.6
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		19.5	0		0.6		16.4	0		0		17.6
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		16.5	3	0	0		14.1	2	0.3	0		15.5	2	0.1
Maximum					43.5					27					35
Total	56		56		43.5	53.6		53.3		27	55.5		55.5		
		3		3			2		2			2		2	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	16:07 (104.0) [5] !Fall 2012!					16:22 (104.0) [3] !Spring 2013!					16:38 (104.0) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	28		0		28	26.3		0		26.3	26.1		0		26.1
2 - 5504 - ALFORD ST @ MAIN ST	0.2		0		28.2	0.3		0		26.6	0.5		0		26.6
3 - 5505 - 173 ALFORD ST	0	3	0		31.2	0	2	0		28.6	0	3	0		29.6
4 - 5506 - BROADWAY @ DEXTER ST	0		0.2		31	0		0		28.6	0.1		0.1		29.6
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		31	0		0.7		27.9	0.1		0.9		28.8
6 - 5508 - BROADWAY @ LANGDON ST	0.6		0.2		31.4	0		1.3		26.6	0		0.3		28.5
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.4		31	0.3		0		26.9	0.1		0.1		28.5
8 - 5565 - BROADWAY @ GLADSTONE ST	0.4		0.8		30.6	0.7		0.7		26.9	0.4		1.4		27.5
9 - 5695 - BROADWAY @ EVERETT SQ	2		4.2		28.4	0.3		5.7		21.5	2.8		3.6		26.7
10 - 5510 - BROADWAY @ MANSFIELD ST	0.8		1		28.2	1.7		2		21.2	1		1.6		26.1
11 - 5511 - BROADWAY @ SUMMER ST	1		1.4		27.8	0		2.7		18.5	2.3		1.5		26.9
12 - 5513 - BROADWAY @ HIGH ST	0		3		24.8	0.3		3.3		15.5	0.5		2.1		25.3
13 - 5514 - BROADWAY @ LEXINGTON ST	0		1.8		23	0		1.3		14.2	0.3		2.3		23.3
14 - 5517 - BROADWAY @ REED AVE	0		2.4		20.6	0		1.7		12.5	0.4		2.5		21.2
15 - 5518 - BROADWAY @ FERRY ST	2.6		6.4		16.8	5.7		4.7		13.5	3.1		4.8		19.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.4		0.2		17	1		0.3		14.2	0.4		0.6		19.3
17 - 5356 - FERRY ST @ SHUTE ST	0.6		0.6		17	1		1.3		13.9	1.1		1.8		18.6
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1.8		1.8		17	1		1.3		13.6	0.6		1.4		17.8
19 - 5358 - FERRY ST @ COOLIDGE ST	0.2		0.2		17	0.3		0.7		13.2	0		0.6		17.2
20 - 5359 - FERRY ST @ RICH ST	0.4		0.8		16.6	1.7		0.7		14.2	1.6		1.6		17.2
21 - 5360 - FERRY ST @ HARVARD ST	1.6		0.8		17.4	0.3		0.3		14.2	0		0.5		16.7
22 - 5361 - FERRY ST @ CROSS ST	1		0.8		17.6	0.3		0.7		13.8	0.3		1.3		15.7
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.4		1		17	0		0		13.8	1.4		0.8		16.3
24 - 5363 - FERRY ST @ HOLYOKE ST	0		0.4		16.6	0.7		0.7		13.8	1.3		1.3		16.3
25 - 5364 - FERRY ST @ EASTERN AVE	0.2		0.4		16.4	0		0		13.8	0		0.1		16.2
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		16.4	0		0.7		13.1	0		0.3		15.9
27 - 5366 - MAIN ST @ CENTRE ST	0		0.6		15.8	0.7		0.7		13.1	0		0.3		15.6
28 - 5342 - MAIN ST OPP PLEASANT ST	0.8		0.8		15.8	0		2.3		10.8	0.3		2.4		13.5
29 - 9215 - MAIN ST @ SALEM ST	0		0.4		15.4	0		0		10.8	0		1.6		11.9
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.4		0.4		15.4	0.3		1.7		9.4	0.1		1.5		10.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.6		14.8	0		0.3		9.1	0		1.1		9.4
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		11.8	3	0	0		9.3	2	-2.2	0		7.5	3	-1.1
Maximum					31.4					28.6					29.6
Total	43.4		43.4			43		45			44.6		45.6		
		3		3			2		2			3		3	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	16:52 (104.0) [1] !Fall 2012!					17:07 (104.0) [6] !Fall 2012!					17:22 (104.0) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	30.5		0		30.5	39.7		0		39.7	32		0		32
2 - 5504 - ALFORD ST @ MAIN ST	1		0		31.5	0.3		0		40	1		0		33
3 - 5505 - 173 ALFORD ST	0	3	0		34.5	0	0	0		40	0	0	0		33
4 - 5506 - BROADWAY @ DEXTER ST	0		0		34.5	0		0.2		39.8	0		0		33
5 - 5507 - BROADWAY @ THORNDIKE ST	4		2		36.5	0.3		1.7		38.4	1		3		31
6 - 5508 - BROADWAY @ LANGDON ST	0		0		36.5	0		0.5		37.9	0		0		31
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		2		34.5	0.5		0.3		38.1	0		2		29
8 - 5565 - BROADWAY @ GLADSTONE ST	0		1		33.5	0.3		1		37.4	0		1		28
9 - 5695 - BROADWAY @ EVERETT SQ	7		5		35.5	1.5		4		34.9	2		0		30
10 - 5510 - BROADWAY @ MANSFIELD ST	2		3		34.5	0.7		1		34.6	0		2		28
11 - 5511 - BROADWAY @ SUMMER ST	2		0		36.5	0.5		1.7		33.4	4		1		31
12 - 5513 - BROADWAY @ HIGH ST	1		7		30.5	1.2		3.8		30.8	1		5		27
13 - 5514 - BROADWAY @ LEXINGTON ST	0		4		26.5	0.5		4.3		27	0		4		23
14 - 5517 - BROADWAY @ REED AVE	0		2		24.5	0.3		3.8		23.5	0		2		21
15 - 5518 - BROADWAY @ FERRY ST	0		11		13.5	1.3		11.8		13	3		1		23
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0		13.5	0.7		1.2		12.5	0		0		23
17 - 5356 - FERRY ST @ SHUTE ST	0		3		10.5	0.2		0.8		11.9	0		2		21
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		1		9.5	0.3		0.7		11.5	0		0		21
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		9.5	0		0.2		11.3	1		1		21
20 - 5359 - FERRY ST @ RICH ST	1		1		9.5	0.5		2.3		9.5	0		2		19
21 - 5360 - FERRY ST @ HARVARD ST	0		0		9.5	0.2		0.2		9.5	0		2		17
22 - 5361 - FERRY ST @ CROSS ST	0		1		8.5	0.2		1.7		8	0		0		17
23 - 5362 - FERRY ST @ MAGNOLIA ST	2		0		10.5	0.2		0.2		8	1		2		16
24 - 5363 - FERRY ST @ HOLYOKE ST	0		0		10.5	0.3		0.5		7.8	0		0		16
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		10.5	0		0		7.8	0		0		16
26 - 5365 - EASTERN AVE @ MAIN ST	0		2		8.5	0		0		7.8	0		3		13
27 - 5366 - MAIN ST @ CENTRE ST	0		1		7.5	0		1.5		6.3	0		3		10
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0		7.5	0.2		1.5		5	0		3		7
29 - 9215 - MAIN ST @ SALEM ST	0		0		7.5	0.5		0.8		4.7	0		0		7
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		4		3.5	0.2		0.7		4.2	1		3		5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		2		1.5	0		0		4.2	0		0		5
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		2.5	3	-4	0		3.8	0	0.4	0		5	0	0
Maximum					36.5					40					33
Total	50.5		54.5			50.5		50.2			47		47		
		3		3			0		0			0		0	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	17:37 (104.0) [8] !Fall 2012!					17:52 (104.0) [7] !Fall 2012!					18:07 (104.0) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	28.5		0		28.5	23.9		0		23.9	22.1		0		22.1
2 - 5504 - ALFORD ST @ MAIN ST	0.1		0.3		28.3	0		0		23.9	0.2		0		22.3
3 - 5505 - 173 ALFORD ST	0	0	0		28.3	0	0	0		23.9	0	1	0		23.3
4 - 5506 - BROADWAY @ DEXTER ST	0		0.1		28.2	0		0.4		23.5	0		0.1		23.2
5 - 5507 - BROADWAY @ THORNDIKE ST	0.8		0.6		28.4	0		0.6		22.9	0.3		0.3		23.2
6 - 5508 - BROADWAY @ LANGDON ST	0		0.5		27.9	0.1		0.7		22.3	0.1		0.4		22.9
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0.3		27.7	0		0.3		22	0.1		0.1		22.9
8 - 5565 - BROADWAY @ GLADSTONE ST	0		2		25.7	0.6		1.1		21.5	0.2		1.3		21.8
9 - 5695 - BROADWAY @ EVERETT SQ	1.9		1.9		25.7	1.7		3.7		19.5	2.2		3.8		20.2
10 - 5510 - BROADWAY @ MANSFIELD ST	1		1.4		25.3	1.3		1.1		19.7	1.1		1.5		19.8
11 - 5511 - BROADWAY @ SUMMER ST	0.6		1.3		24.6	0.4		0.7		19.4	0.2		0.8		19.2
12 - 5513 - BROADWAY @ HIGH ST	0.4		4		21	0.1		3.4		16.1	0.2		2.9		16.5
13 - 5514 - BROADWAY @ LEXINGTON ST	0.3		2.6		18.7	0		2.9		13.2	0.1		2.3		14.3
14 - 5517 - BROADWAY @ REED AVE	0		1.9		16.8	0		0.7		12.5	0.2		1.1		13.4
15 - 5518 - BROADWAY @ FERRY ST	1.6		6.9		11.5	0.9		3.3		10.1	1.3		4.5		10.2
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0		11.5	0		0		10.1	0.2		0.3		10.1
17 - 5356 - FERRY ST @ SHUTE ST	0.5		1.5		10.5	0		0.7		9.4	0.4		0.9		9.6
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0.4		1.4		9.5	0.1		1.3		8.2	0.1		0.6		9.1
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0.3		9.2	0.1		0.1		8.2	0.1		0.1		9.1
20 - 5359 - FERRY ST @ RICH ST	0.3		0.9		8.6	0		2		6.2	0.3		0.7		8.7
21 - 5360 - FERRY ST @ HARVARD ST	0.3		0.3		8.6	0.1		0.4		5.9	0.5		0.2		9
22 - 5361 - FERRY ST @ CROSS ST	0.4		0.4		8.6	0.1		1.4		4.6	0.5		0.3		9.2
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.1		0.9		7.8	0.3		0.9		4	0.3		0.9		8.6
24 - 5363 - FERRY ST @ HOLYOKE ST	0		0.8		7	0.3		0		4.3	0		0.4		8.2
25 - 5364 - FERRY ST @ EASTERN AVE	0.3		0.4		6.9	0		0		4.3	0		0		8.2
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		6.9	0		0.3		4	0		0		8.2
27 - 5366 - MAIN ST @ CENTRE ST	0		0.8		6.1	0.3		0.9		3.4	0.1		0.9		7.4
28 - 5342 - MAIN ST OPP PLEASANT ST	0.4		2		4.5	0.2		0.7		2.9	0.1		0.6		6.9
29 - 9215 - MAIN ST @ SALEM ST	0		0		4.5	0		0		2.9	0		0		6.9
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.4		0.1		4.8	0		0.2		2.7	0		0.9		6
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		4.8	0.2		0		2.9	0		0		6
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4.8	0	1.78E-15	0		2.9	0	4.44E-16	0		5	1	0
Maximum					28.5					23.9					23.3
Total	38.1		37.9			30.8		30.7			30.5		30.7		
		0		0			0		0			1		1	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:22 (104.0) [5] !Fall 2012!					18:40 (104.0) [1] !Fall 2012!					18:55 (104.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	27.6		0		27.6	20		0		20	32.7		0		32.7
2 - 5504 - ALFORD ST @ MAIN ST	0		0		27.6	0		0		20	0.7		0.7		32.7
3 - 5505 - 173 ALFORD ST	0	1	0		28.6	0	0	0		20	0	1	0		33.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0.4		28.2	0		0		20	0		0		33.7
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0.6		27.6	1		3		18	0.3		0.3		33.7
6 - 5508 - BROADWAY @ LANGDON ST	0.8		1		27.4	0		1		17	0		0.3		33.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.2		27.2	0		1		16	0		0.3		33.1
8 - 5565 - BROADWAY @ GLADSTONE ST	0.4		2.2		25.4	0		4		12	0		0		33.1
9 - 5695 - BROADWAY @ EVERETT SQ	0.8		3.6		22.6	1		3		10	1.7		3.3		31.5
10 - 5510 - BROADWAY @ MANSFIELD ST	2		1.2		23.4	1		0		11	1		2.7		29.8
11 - 5511 - BROADWAY @ SUMMER ST	1		0.6		23.8	0		0		11	0		0.7		29.1
12 - 5513 - BROADWAY @ HIGH ST	0.2		3.4		20.6	0		2		9	1.3		5		25.4
13 - 5514 - BROADWAY @ LEXINGTON ST	0		1.8		18.8	1		3		7	0		2		23.4
14 - 5517 - BROADWAY @ REED AVE	0		1.6		17.2	0		0		7	0		1		22.4
15 - 5518 - BROADWAY @ FERRY ST	1.6		6.4		12.4	0		2		5	1.7		8.7		15.4
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.4		0.2		12.6	0		0		5	0		0.3		15.1
17 - 5356 - FERRY ST @ SHUTE ST	0.6		1.8		11.4	0		0		5	0.3		0.3		15.1
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0.4		0		11.8	0		0		5	0		2.3		12.8
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0.6		11.2	0		0		5	0.3		0		13.1
20 - 5359 - FERRY ST @ RICH ST	0.2		2		9.4	0		4		1	0.3		2		11.4
21 - 5360 - FERRY ST @ HARVARD ST	0.8		0.2		10	0		0		1	0		1		10.4
22 - 5361 - FERRY ST @ CROSS ST	0.8		1.2		9.6	0		0		1	0		1		9.4
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.6		0.2		10	1		0		2	0.7		1.3		8.8
24 - 5363 - FERRY ST @ HOLYOKE ST	0.2		1		9.2	0		0		2	0		0		8.8
25 - 5364 - FERRY ST @ EASTERN AVE	0		0.4		8.8	0		0		2	0		0		8.8
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		8.8	0		0		2	0		1		7.8
27 - 5366 - MAIN ST @ CENTRE ST	0.2		1		8	0		0		2	0		1		6.8
28 - 5342 - MAIN ST OPP PLEASANT ST	0		1.2		6.8	1		3		0	0		0.7		6.1
29 - 9215 - MAIN ST @ SALEM ST	0		0		6.8	0		0		0	0		0		6.1
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		1		5.8	0		0		0	0		0		6.1
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.4		5.4	0		0		0	1		1.3		5.8
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4.4	1	0	0		0	0	0	0		4.7	1	0.1
Maximum					28.6					20					33.7
Total	38.6		38.6			26		26			42		42		
		1		1			0		0			1		1	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	19:20 (104.0) [6] !Fall 2012!					20:15 (104.0) [11] !Fall 2012!					21:15 (104.0) [7] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	23.3		0		23.3	32.6		0		32.6	31.7		0		31.7
2 - 5504 - ALFORD ST @ MAIN ST	0.3		0.5		23.1	0.1		0		32.7	0.1		0.4		31.4
3 - 5505 - 173 ALFORD ST	0	9	0		32.1	0	5	0		37.7	0.3	5	0		36.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0		32.1	0		0.1		37.6	0.1		0		36.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0.5		31.6	0.5		1.1		37	0.1		0.3		36.6
6 - 5508 - BROADWAY @ LANGDON ST	0		0.3		31.3	0.2		0.5		36.7	0.1		0.4		36.3
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.2		0.5		31	0.1		0.3		36.5	0		0.1		36.2
8 - 5565 - BROADWAY @ GLADSTONE ST	0		1.2		29.8	0.2		1.6		35.1	0		1		35.2
9 - 5695 - BROADWAY @ EVERETT SQ	2.2		3.7		28.3	1.4		7.1		29.4	1		3.3		32.9
10 - 5510 - BROADWAY @ MANSFIELD ST	1		1.5		27.8	0.5		1.2		28.7	1.1		1.3		32.7
11 - 5511 - BROADWAY @ SUMMER ST	0.8		1.8		26.8	0.3		2.1		26.9	0		1.3		31.4
12 - 5513 - BROADWAY @ HIGH ST	0.3		3		24.1	0.5		3.7		23.7	0.4		2.6		29.2
13 - 5514 - BROADWAY @ LEXINGTON ST	0.3		3		21.4	0.2		2.3		21.6	0.1		1.4		27.9
14 - 5517 - BROADWAY @ REED AVE	0		2		19.4	0.3		1.5		20.4	0		1.9		26
15 - 5518 - BROADWAY @ FERRY ST	1		3.5		16.9	2.1		7.5		15	1.4		5.3		22.1
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0.3		16.6	0.4		1.2		14.2	1.3		0.4		23
17 - 5356 - FERRY ST @ SHUTE ST	0.3		0		16.9	1		2.5		12.7	0.1		1.1		22
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0.3		0.8		16.4	0.5		1.2		12	0.1		1		21.1
19 - 5358 - FERRY ST @ COOLIDGE ST	0.2		1.3		15.3	0		0.4		11.6	0.3		1.1		20.3
20 - 5359 - FERRY ST @ RICH ST	0.3		0.8		14.8	0.5		1.9		10.2	0.4		3.1		17.6
21 - 5360 - FERRY ST @ HARVARD ST	0.2		0.5		14.5	0.5		1.9		8.8	0.3		1.4		16.5
22 - 5361 - FERRY ST @ CROSS ST	0		0.3		14.2	0.5		1.9		7.4	1.7		2.1		16.1
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.2		0.5		13.9	0		1.3		6.1	0		0.4		15.7
24 - 5363 - FERRY ST @ HOLYOKE ST	0.5		1.7		12.7	0.5		0.7		5.9	0.4		1.7		14.4
25 - 5364 - FERRY ST @ EASTERN AVE	0.2		0.2		12.7	0		1		4.9	0		0.3		14.1
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		12.7	0		0.3		4.6	0		0.3		13.8
27 - 5366 - MAIN ST @ CENTRE ST	0		1.7		11	0		0.2		4.4	0		0		13.8
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.3		10.7	0.1		0.5		4	0		0.6		13.2
29 - 9215 - MAIN ST @ SALEM ST	0		0		10.7	0		0.2		3.8	0		0		13.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.3		0.8		10.2	0.1		0.9		3	0.1		0.3		13
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.8		9.4	0		0.4		2.6	0		0.1		12.9
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		0.3	9	0.1	0		0.7	5	-3.1	0		7.9	5	1.42E-14
Maximum					32.1					37.7					36.8
Total	32		32			43		46			41.6		41.3		
		9		9			5		5			5		5	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	22:15 (104.0) [10] !Fall 2012!					23:15 (104.0) [6] !Fall 2012!					24:15 (104.0) [13] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	34.4		0		34.4	43.2		0		43.2	40.6		0		40.6
2 - 5504 - ALFORD ST @ MAIN ST	0.4		0		34.8	0		0		43.2	0.2		0		40.8
3 - 5505 - 173 ALFORD ST	0	5	0		39.8	0.3	5	0.2		48.3	0	4	0		44.8
4 - 5506 - BROADWAY @ DEXTER ST	0		0.2		39.6	0		0		48.3	0		0		44.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0.6		0.7		39.5	0.8		2.5		46.6	0.2		0.8		44.2
6 - 5508 - BROADWAY @ LANGDON ST	0		0		39.5	0.3		0.3		46.6	0.1		0.1		44.2
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.1		39.7	0		1.3		45.3	0.2		0.6		43.8
8 - 5565 - BROADWAY @ GLADSTONE ST	0.1		0.9		38.9	0		4.7		40.6	0.2		1.8		42.2
9 - 5695 - BROADWAY @ EVERETT SQ	0.8		2		37.7	0.3		1.8		39.1	0.6		3.1		39.7
10 - 5510 - BROADWAY @ MANSFIELD ST	0.2		2.1		35.8	0.2		1.3		38	0.2		1.8		38.1
11 - 5511 - BROADWAY @ SUMMER ST	0		0.9		34.9	0.3		1		37.3	0.2		1.8		36.5
12 - 5513 - BROADWAY @ HIGH ST	0.3		2.3		32.9	0.2		3.8		33.7	0.2		5.6		31.1
13 - 5514 - BROADWAY @ LEXINGTON ST	0		1.4		31.5	0		2		31.7	0		2.7		28.4
14 - 5517 - BROADWAY @ REED AVE	0.3		1.4		30.4	0		1.8		29.9	0		3.2		25.2
15 - 5518 - BROADWAY @ FERRY ST	2.3		6.2		26.5	1.3		8.2		23	0.4		7.1		18.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0		26.5	0		0.2		22.8	0		0.2		18.3
17 - 5356 - FERRY ST @ SHUTE ST	0.9		2.2		25.2	0		2.5		20.3	0.1		1.8		16.6
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0.4		1.4		24.2	0.3		2.8		17.8	0.1		1		15.7
19 - 5358 - FERRY ST @ COOLIDGE ST	0.1		1.3		23	0		1		16.8	0		1.2		14.5
20 - 5359 - FERRY ST @ RICH ST	2		3.7		21.3	0.5		2.2		15.1	0		3.1		11.4
21 - 5360 - FERRY ST @ HARVARD ST	0.6		1.8		20.1	0.3		0.8		14.6	0.1		2.1		9.4
22 - 5361 - FERRY ST @ CROSS ST	0.1		3.4		16.8	0.2		2.7		12.1	0		1.8		7.6
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.1		1.9		15	0.5		1		11.6	0		2.2		5.4
24 - 5363 - FERRY ST @ HOLYOKE ST	0.1		2.1		13	0		1.5		10.1	0		1.5		3.9
25 - 5364 - FERRY ST @ EASTERN AVE	0.1		1.6		11.5	0		0.2		9.9	0		0.6		3.3
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.4		11.1	0		0.5		9.4	0		0		3.3
27 - 5366 - MAIN ST @ CENTRE ST	0		0.4		10.7	0		1		8.4	0.1		0		3.4
28 - 5342 - MAIN ST OPP PLEASANT ST	0.1		0.8		10	0.2		0.7		7.9	0.2		0.4		3.2
29 - 9215 - MAIN ST @ SALEM ST	0		0.3		9.7	0		0.3		7.6	0		0		3.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0.4		9.3	0		0		7.6	0		0		3.2
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.4		8.9	0		0		7.6	0		0		3.2
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		15.7	5	-11.8	0		2.5	5	0.1	0		1.9	4	-2.7
Maximum					39.8					48.3					44.8
Total	44.3		56.1			49		48.8			43.4		46.2		
		5		5			5		5			4		4	

Massachusetts Bay Transportation Authority
Route 104
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Total		
Seq - StopID - Stop Name	On	Off	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	989.2	0	989.2
2 - 5504 - ALFORD ST @ MAIN ST	9.4	2.5	996.1
3 - 5505 - 173 ALFORD ST	0.6	0.3	1103.4
4 - 5506 - BROADWAY @ DEXTER ST	0.2	7.5	1096.1
5 - 5507 - BROADWAY @ THORNDIKE ST	35.6	40.7	1091
6 - 5508 - BROADWAY @ LANGDON ST	12.9	29.5	1074.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	9.4	14.9	1068.9
8 - 5565 - BROADWAY @ GLADSTONE ST	23.5	57.6	1034.8
9 - 5695 - BROADWAY @ EVERETT SQ	95.5	138.8	991.5
10 - 5510 - BROADWAY @ MANSFIELD ST	52.7	54.8	989.4
11 - 5511 - BROADWAY @ SUMMER ST	47.5	49.1	987.8
12 - 5513 - BROADWAY @ HIGH ST	41.9	103.7	926
13 - 5514 - BROADWAY @ LEXINGTON ST	12.4	77.9	860.5
14 - 5517 - BROADWAY @ REED AVE	28	59.9	828.6
15 - 5518 - BROADWAY @ FERRY ST	161.4	228	762
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	38.4	14.9	785.5
17 - 5356 - FERRY ST @ SHUTE ST	87.1	40.8	831.8
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	61.7	40.8	852.7
19 - 5358 - FERRY ST @ COOLIDGE ST	22.1	17	857.8
20 - 5359 - FERRY ST @ RICH ST	84.9	48.1	894.6
21 - 5360 - FERRY ST @ HARVARD ST	56.9	20.3	931.2
22 - 5361 - FERRY ST @ CROSS ST	72.4	32	971.6
23 - 5362 - FERRY ST @ MAGNOLIA ST	72.8	22.8	1021.6
24 - 5363 - FERRY ST @ HOLYOKE ST	72.1	24.9	1068.8
25 - 5364 - FERRY ST @ EASTERN AVE	6.5	16.4	1058.9
26 - 5365 - EASTERN AVE @ MAIN ST	5	19.8	1044.1
27 - 5366 - MAIN ST @ CENTRE ST	3.4	37.3	1010.2
28 - 5342 - MAIN ST OPP PLEASANT ST	17.4	94.1	933.5
29 - 9215 - MAIN ST @ SALEM ST	9.1	22.4	920.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	29.6	31.2	918.6
31 - 5369 - FLORENCE ST @ WASHINGTON ST	3.4	11.2	910.8
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0	830.9	-27.1
Maximum	0	0	1557.7
Total	2159.2	2185.5	926.1

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	05:00 (104.0) [3] !Fall 2012!					05:45 (104.0) [3] !Fall 2012!					06:30 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	1.3	0	0		1.3	0	1	0		1	1.5	1	0		2.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		1.3	0.3		0.7		0.6	0.5		0		3
3 - 5342 - MAIN ST OPP PLEASANT ST	0.3		0		1.6	0		0		0.6	0		0		3
4 - 5343 - FERRY ST @ CENTRE ST	0		0		1.6	0		0		0.6	0		0		3
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		1.6	0		0		0.6	0.5		0		3.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		0		2.6	2		0		2.6	0.5		0.5		3.5
7 - 5346 - FERRY ST OPP MAGNOLIA ST	2		0		4.6	0.7		0		3.3	0.5		0		4
8 - 5347 - FERRY ST @ CROSS ST	1		0		5.6	2.7		0		6	0		0		4
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		5.6	1		0		7	0.5		0		4.5
10 - 5349 - FERRY ST @ BELMONT ST	0.7		0		6.3	3.3		0		10.3	0.5		0		5
11 - 5350 - FERRY ST @ BENNETT ST	0.7		0		7	0.7		0.3		10.7	0		0		5
12 - 5351 - FERRY ST @ CENTRAL AVE	3.3		0		10.3	1.7		0		12.4	1.5		0		6.5
13 - 5352 - FERRY ST @ GLENDALE ST	3		0		13.3	2.3		0		14.7	2.5		0		9
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.3		0		13.6	0		0		14.7	0		0		9
15 - 5354 - FERRY ST @ BROADWAY	2		0		15.6	8		1		21.7	2.5		0		11.5
16 - 5489 - BROADWAY @ WAVERLY AVE	2.7		0		18.3	2.3		0		24	3.5		0		15
17 - 5490 - BROADWAY @ RAYMOND ST	8		0		26.3	7.3		0		31.3	7		0		22
18 - 5492 - BROADWAY @ HANCOCK ST	4		0.3		30	4.3		0		35.6	5.5		0.5		27
19 - 5493 - BROADWAY @ PLEASANT ST	3.3		0.7		32.6	1.7		0		37.3	2		0		29
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		32.6	0		0		37.3	0.5		1		28.5
21 - 5495 - BROADWAY @ CHURCH ST	1		0		33.6	2.3		0		39.6	0.5		0		29
22 - 5496 - BROADWAY @ NORWOOD ST	11.3		0		44.9	5.3		0.3		44.6	5.5		0.5		34
23 - 5559 - BROADWAY OPP SECOND ST	0		0		44.9	1		0		45.6	0.5		0		34.5
24 - 5560 - BROADWAY @ GLADSTONE ST	3		0.3		47.6	2.7		0.3		48	0.5		0		35
25 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0		47.9	0.3		0		48.3	0		0		35
26 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.3		47.9	1.3		0		49.6	0.5		1		34.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	0.3		0.3		47.9	1		0		50.6	0		0.5		34
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		47.9	0		0		50.6	0		0		34
29 - 5501 - OPP 173 ALFORD ST	0		0	0	47.9	0		0	1	49.6	0		0	1	33
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		47.9	0		0		49.6	0		0		33
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		47.9	0		0		49.6	0		0		33
32 - 5502 - ALFORD ST @ WEST ST	0		0		47.9	0		0		49.6	0		0		33
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		48.3		-0.4	0		49.7		-0.1	0		33		0
Maximum					47.9					50.6					35
Total	49.8	0	50.2	0		52.3		52.3			37		37		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	07:00 (104.0) [4] !Fall 2012!					07:30 (104.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	2	1	0		3	7.5	1	0		8.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0.3		0		3.3	0		0.5		8
3 - 5342 - MAIN ST OPP PLEASANT ST	0		0		3.3	0		1		7
4 - 5343 - FERRY ST @ CENTRE ST	0		0		3.3	0		0		7
5 - 5344 - FERRY ST @ EASTERN AVE	0		0.3		3	0		0.5		6.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		0.5		3	1		0.5		7
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1		0		4	1		0.5		7.5
8 - 5347 - FERRY ST @ CROSS ST	0.3		0.3		4	1.5		0.5		8.5
9 - 5348 - FERRY ST @ WINTHROP ST	0.5		0		4.5	0		0		8.5
10 - 5349 - FERRY ST @ BELMONT ST	1.8		0		6.3	2.5		0		11
11 - 5350 - FERRY ST @ BENNETT ST	0.5		0		6.8	0		0		11
12 - 5351 - FERRY ST @ CENTRAL AVE	1		0		7.8	1.5		0		12.5
13 - 5352 - FERRY ST @ GLENDALE ST	1.5		0		9.3	2		0		14.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	1		0		10.3	0		0		14.5
15 - 5354 - FERRY ST @ BROADWAY	4.5		0.5		14.3	6.5		1		20
16 - 5489 - BROADWAY @ WAVERLY AVE	2.8		0		17.1	1.5		0.5		21
17 - 5490 - BROADWAY @ RAYMOND ST	3.3		0		20.4	1.5		0.5		22
18 - 5492 - BROADWAY @ HANCOCK ST	4		0.3		24.1	5.5		0.5		27
19 - 5493 - BROADWAY @ PLEASANT ST	3		0.5		26.6	1		0		28
20 - 5494 - BROADWAY @ WEBSTER ST	1.8		0		28.4	3		0.5		30.5
21 - 5495 - BROADWAY @ CHURCH ST	0.8		0		29.2	0.5		0		31
22 - 5496 - BROADWAY @ NORWOOD ST	6.3		0.3		35.2	6.5		2		35.5
23 - 5559 - BROADWAY OPP SECOND ST	0.5		0		35.7	0		0.5		35
24 - 5560 - BROADWAY @ GLADSTONE ST	0.5		0		36.2	2		0.5		36.5
25 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0		36.5	1		0		37.5
26 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0		36.8	2		0		39.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	2.3		0.3		38.8	0.5		0.5		39.5
28 - 5500 - BROADWAY @ HORIZON WAY	1.5		0		40.3	0		0		39.5
29 - 5501 - OPP 173 ALFORD ST	0		0	1	39.3	0		0	1	38.5
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		39.3	0		0		38.5
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		39.3	0		0.5		38
32 - 5502 - ALFORD ST @ WEST ST	0		0		39.3	0		0.5		37.5
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		37.5		1.8	0		38		-0.5
Maximum					40.3					39.5
Total	41.8		40.3			48.5		49		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	08:00 (104.0) [4] !Fall 2012!					08:30 (104.0) [2] !Fall 2012!					09:00 (104.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	5.3	2	0		7.3	3.5	1	0		4.5	3	2	0		5
2 - 5289 - CENTRE ST @ STOP & SHOP	0.5		0.3		7.5	0.5		0.5		4.5	2		0		7
3 - 5342 - MAIN ST OPP PLEASANT ST	0		0.3		7.2	0		1		3.5	0		0		7
4 - 5343 - FERRY ST @ CENTRE ST	0		0		7.2	0		0		3.5	0		1		6
5 - 5344 - FERRY ST @ EASTERN AVE	0.3		0.5		7	0.5		0.5		3.5	0		0		6
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		0		7	0.5		0		4	0		0		6
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.5		0		7.5	0		0.5		3.5	2		0		8
8 - 5347 - FERRY ST @ CROSS ST	0.5		0.3		7.7	1.5		0		5	1		1		8
9 - 5348 - FERRY ST @ WINTHROP ST	0.8		0.3		8.2	1		0		6	0		0		8
10 - 5349 - FERRY ST @ BELMONT ST	2.8		0.3		10.7	2		0.5		7.5	5		0		13
11 - 5350 - FERRY ST @ BENNETT ST	0.8		0.3		11.2	0		0		7.5	0		0		13
12 - 5351 - FERRY ST @ CENTRAL AVE	3.3		0.3		14.2	3		0		10.5	0		0		13
13 - 5352 - FERRY ST @ GLENDALE ST	1.5		0		15.7	0.5		0		11	1		0		14
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.8		0.3		16.2	0		0.5		10.5	0		0		14
15 - 5354 - FERRY ST @ BROADWAY	4.3		0.5		20	7		1		16.5	7		1		20
16 - 5489 - BROADWAY @ WAVERLY AVE	1.5		0		21.5	0.5		0		17	0		0		20
17 - 5490 - BROADWAY @ RAYMOND ST	5.5		0.3		26.7	2.5		0		19.5	4		0		24
18 - 5492 - BROADWAY @ HANCOCK ST	4.8		0		31.5	4		0.5		23	3		0		27
19 - 5493 - BROADWAY @ PLEASANT ST	1.8		0.5		32.8	0		1.5		21.5	0		0		27
20 - 5494 - BROADWAY @ WEBSTER ST	1.3		0		34.1	3		0		24.5	0		0		27
21 - 5495 - BROADWAY @ CHURCH ST	1.3		1		34.4	2		1		25.5	0		0		27
22 - 5496 - BROADWAY @ NORWOOD ST	9		1		42.4	9		1		33.5	6		0		33
23 - 5559 - BROADWAY OPP SECOND ST	1.3		0.3		43.4	2		0.5		35	2		0		35
24 - 5560 - BROADWAY @ GLADSTONE ST	3.8		0.3		46.9	1		0		36	0		1		34
25 - 5497 - BROADWAY @ BOWDOIN ST	1.3		0		48.2	0.5		0		36.5	0		0		34
26 - 5498 - BROADWAY OPP BEACHAM ST	0.8		0		49	0		0		36.5	0		0		34
27 - 5499 - BROADWAY OPP THORNDIKE ST	1.5		0.8		49.7	0		0		36.5	2		0		36
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		49.7	1		0		37.5	0		0		36
29 - 5501 - OPP 173 ALFORD ST	0		0	2	47.7	0		0	1	36.5	0		0	2	34
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		47.7	0		0.5		36	0		0		34
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		47.7	0		0		36	0		0		34
32 - 5502 - ALFORD ST @ WEST ST	0		0		47.7	0		0		36	0		0		34
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		47.5		0.2	0		36		0	0		34		0
Maximum					49.7					37.5					36
Total	54.5		54.5			45.5		45.5			38		38		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	09:30 (104.0) [2] !Fall 2012!					10:00 (104.0) [1] !Fall 2012!					10:35 (104.0) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	3.5	3	0		6.5	7	3	0		10	11	4	0		15
2 - 5289 - CENTRE ST @ STOP & SHOP	1.5		0.5		7.5	0		0		10	2		1.3		15.7
3 - 5342 - MAIN ST OPP PLEASANT ST	1		0		8.5	3		1		12	3.3		0.7		18.3
4 - 5343 - FERRY ST @ CENTRE ST	0		0		8.5	0		0		12	0		0		18.3
5 - 5344 - FERRY ST @ EASTERN AVE	0.5		0		9	0		0		12	0.3		0		18.6
6 - 5345 - FERRY ST OPP ELMWOOD PK	1		0.5		9.5	0		0		12	1		1		18.6
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0		9.5	0		2		10	0		0		18.6
8 - 5347 - FERRY ST @ CROSS ST	1		0.5		10	0		0		10	0		0.3		18.3
9 - 5348 - FERRY ST @ WINTHROP ST	0		1		9	0		1		9	0		0.7		17.6
10 - 5349 - FERRY ST @ BELMONT ST	1		0		10	2		0		11	0.3		0.7		17.2
11 - 5350 - FERRY ST @ BENNETT ST	0.5		0.5		10	0		0		11	1		0		18.2
12 - 5351 - FERRY ST @ CENTRAL AVE	0		0		10	1		1		11	1.7		1		18.9
13 - 5352 - FERRY ST @ GLENDALE ST	0		0		10	1		0		12	1.3		0		20.2
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	1		0		11	0		0		12	1.3		0		21.5
15 - 5354 - FERRY ST @ BROADWAY	6		0.5		16.5	8		5		15	2.3		2		21.8
16 - 5489 - BROADWAY @ WAVERLY AVE	2.5		0		19	0		0		15	2		2		21.8
17 - 5490 - BROADWAY @ RAYMOND ST	7.5		0.5		26	4		0		19	3.3		1		24.1
18 - 5492 - BROADWAY @ HANCOCK ST	4		0		30	3		0		22	2		1.3		24.8
19 - 5493 - BROADWAY @ PLEASANT ST	1		1.5		29.5	0		0		22	0.7		0		25.5
20 - 5494 - BROADWAY @ WEBSTER ST	2		0		31.5	1		0		23	0		0		25.5
21 - 5495 - BROADWAY @ CHURCH ST	1		1.5		31	2		2		23	1.7		0.7		26.5
22 - 5496 - BROADWAY @ NORWOOD ST	10		1		40	3		0		26	5.7		2.7		29.5
23 - 5559 - BROADWAY OPP SECOND ST	2.5		0.5		42	1		0		27	7		0.7		35.8
24 - 5560 - BROADWAY @ GLADSTONE ST	2.5		0		44.5	0		0		27	1		1		35.8
25 - 5497 - BROADWAY @ BOWDOIN ST	1		0		45.5	0		0		27	1		0		36.8
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		45.5	0		1		26	0.7		0		37.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		46.5	0		0		26	1		0		38.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		46.5	1		0		27	0		0		38.5
29 - 5501 - OPP 173 ALFORD ST	0		0	3	43.5	0		0	3	24	0		0	4	34.5
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		43.5	0		0		24	0		0		34.5
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		43.5	0		0		24	0		0		34.5
32 - 5502 - ALFORD ST @ WEST ST	0		0		43.5	0		1		23	0		0		34.5
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		44		-0.5	0		22		1	0		34.7		-0.2
Maximum					46.5					27					38.5
Total	52		52.5			37		36			51.7		51.7		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	11:10 (104.0) [1] !Fall 2012!					11:45 (104.0) [3] !Fall 2012!					12:20 (104.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	7	4	0		11	4	3	0		7	8	4	0		12
2 - 5289 - CENTRE ST @ STOP & SHOP	2		0		13	8.3		8		7.3	3		0		15
3 - 5342 - MAIN ST OPP PLEASANT ST	4		0		17	2		0.7		8.6	2		1		16
4 - 5343 - FERRY ST @ CENTRE ST	0		0		17	0		0		8.6	0		0		16
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		17	0		0.3		8.3	0		0		16
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		0		17	0.3		0.7		7.9	1		2		15
7 - 5346 - FERRY ST OPP MAGNOLIA ST	2		0		19	2.3		1		9.2	1		1		15
8 - 5347 - FERRY ST @ CROSS ST	1		1		19	0.7		0.7		9.2	1		2		14
9 - 5348 - FERRY ST @ WINTHROP ST	1		1		19	1.7		0.7		10.2	0		1		13
10 - 5349 - FERRY ST @ BELMONT ST	1		1		19	1		0.3		10.9	0		2		11
11 - 5350 - FERRY ST @ BENNETT ST	2		0		21	0.3		0		11.2	3		0		14
12 - 5351 - FERRY ST @ CENTRAL AVE	0		0		21	1.3		0.3		12.2	0		0		14
13 - 5352 - FERRY ST @ GLENDALE ST	0		1		20	0.3		0.7		11.8	0		2		12
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		1		19	0		0		11.8	0		0		12
15 - 5354 - FERRY ST @ BROADWAY	4		0		23	2.3		0.3		13.8	3		2		13
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		23	2.7		1		15.5	0		0		13
17 - 5490 - BROADWAY @ RAYMOND ST	6		1		28	0		0.7		14.8	4		0		17
18 - 5492 - BROADWAY @ HANCOCK ST	8		1		35	6		0		20.8	0		0		17
19 - 5493 - BROADWAY @ PLEASANT ST	0		0		35	1.3		1.3		20.8	1		1		17
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		35	0		0.3		20.5	1		2		16
21 - 5495 - BROADWAY @ CHURCH ST	2		2		35	0.7		0.7		20.5	2		1		17
22 - 5496 - BROADWAY @ NORWOOD ST	7		3		39	3.7		1		23.2	5		1		21
23 - 5559 - BROADWAY OPP SECOND ST	0		0		39	1.3		0.7		23.8	0		0		21
24 - 5560 - BROADWAY @ GLADSTONE ST	2		2		39	1		0.3		24.5	1		0		22
25 - 5497 - BROADWAY @ BOWDOIN ST	1		2		38	0.7		0		25.2	3		0		25
26 - 5498 - BROADWAY OPP BEACHAM ST	2		1		39	0.7		0.3		25.6	0		0		25
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		1		39	0.3		0		25.9	0		0		25
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		39	0.3		0		26.2	0		0		25
29 - 5501 - OPP 173 ALFORD ST	0		0	4	35	0		0	3	23.2	0		0	4	21
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		35	0		0		23.2	0		0		21
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		35	0		0		23.2	0		0		21
32 - 5502 - ALFORD ST @ WEST ST	0		0		35	0		0		23.2	0		0		21
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		35		0	0		23.7		-0.5	0		21		0
Maximum					39					26.2					25
Total	53		53			43.3		43.7			39		39		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar														
	12:55 (104.0) [2] !Fall 2012!					13:30 (104.0) [3] !Fall 2012!					14:05 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	6	4	0		10	9.7	8	0		17.7	10.4	4	0		14.4
2 - 5289 - CENTRE ST @ STOP & SHOP	2		0		12	3		0		20.7	0.2		0.2		14.4
3 - 5342 - MAIN ST OPP PLEASANT ST	0.5		0		12.5	3		0		23.7	1		0.2		15.2
4 - 5343 - FERRY ST @ CENTRE ST	0		0.5		12	0		0		23.7	0		0.5		14.7
5 - 5344 - FERRY ST @ EASTERN AVE	1		0		13	0		0		23.7	0		0.5		14.2
6 - 5345 - FERRY ST OPP ELMWOOD PK	1.5		1.5		13	0.3		1.3		22.7	0		2		12.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	1		1		13	0		0.7		22	0		0.5		11.7
8 - 5347 - FERRY ST @ CROSS ST	0		0		13	0		1.7		20.3	0.5		1		11.2
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		13	0		0		20.3	1		1		11.2
10 - 5349 - FERRY ST @ BELMONT ST	1.5		1.5		13	1		2		19.3	0		0.5		10.7
11 - 5350 - FERRY ST @ BENNETT ST	0		0		13	4		2.3		21	0.5		0.5		10.7
12 - 5351 - FERRY ST @ CENTRAL AVE	0.5		0		13.5	0		0		21	0.5		0.5		10.7
13 - 5352 - FERRY ST @ GLENDALE ST	2		0.5		15	0.5		0.5		21	0.5		0.5		10.7
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.5		0		15.5	0		0		21	0		0		10.7
15 - 5354 - FERRY ST @ BROADWAY	8.5		1		23	3.5		6.5		18	4.5		2		13.2
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0.5		22.5	0.5		0.5		18	0		0		13.2
17 - 5490 - BROADWAY @ RAYMOND ST	5.5		0.5		27.5	4.5		0.5		22	5		0.5		17.7
18 - 5492 - BROADWAY @ HANCOCK ST	0		0.5		27	1.5		1		22.5	3.5		0.5		20.7
19 - 5493 - BROADWAY @ PLEASANT ST	0.5		0.5		27	1.5		1		23	1		1		20.7
20 - 5494 - BROADWAY @ WEBSTER ST	0.5		0.5		27	0		0		23	1		0		21.7
21 - 5495 - BROADWAY @ CHURCH ST	0		0		27	2.5		0.5		25	0		1		20.7
22 - 5496 - BROADWAY @ NORWOOD ST	10.5		1.5		36	9		0.7		33.3	9.5		1		29.2
23 - 5559 - BROADWAY OPP SECOND ST	0.5		1		35.5	2.3		0.3		35.3	0.5		0		29.7
24 - 5560 - BROADWAY @ GLADSTONE ST	2		0		37.5	4.3		2		37.6	0		0		29.7
25 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0		38	0		0		37.6	1.5		0		31.2
26 - 5498 - BROADWAY OPP BEACHAM ST	1.5		0		39.5	1		0.3		38.3	1.5		0		32.7
27 - 5499 - BROADWAY OPP THORNDIKE ST	0.5		0		40	0.7		0.7		38.3	1.5		1		33.2
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		40	0		0		38.3	0		0		33.2
29 - 5501 - OPP 173 ALFORD ST	0		0	4	36	0		0	8	30.3	0		0	4	29.2
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		36	0		0		30.3	0		0		29.2
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		36	0		0		30.3	0		0		29.2
32 - 5502 - ALFORD ST @ WEST ST	0		0		36	0		0		30.3	0		0		29.2
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		37		-1	0		31.3		-1	0		20.3		8.9
Maximum					40					38.3					33.2
Total	47		48			52.8		53.8			44.1		35.2		

Massachusetts Bay Transportation Authority
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	[Observations]														
	14:40 (104.0) [3] !Fall 2012!					15:15 (104.0) [3] !Fall 2012!					15:50 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	14.7	4	0		18.7	15.2	4	0		19.2	14.5	4	0		18.5
2 - 5289 - CENTRE ST @ STOP & SHOP	2.3		0		21	3.6		0.4		22.4	4		0		22.5
3 - 5342 - MAIN ST OPP PLEASANT ST	3		0		24	0.4		0		22.8	3		0.5		25
4 - 5343 - FERRY ST @ CENTRE ST	0		0.3		23.7	0		0		22.8	0		0		25
5 - 5344 - FERRY ST @ EASTERN AVE	2.7		1		25.4	1		0.7		23.1	0.5		0		25.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.3		1		24.7	1		2.3		21.8	0.5		1		25
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0.7		24	0.7		0.7		21.8	1		1		25
8 - 5347 - FERRY ST @ CROSS ST	0		1		23	1		1.3		21.5	0		2.5		22.5
9 - 5348 - FERRY ST @ WINTHROP ST	0.5		0		23.5	0.7		0.3		21.9	0.5		2.5		20.5
10 - 5349 - FERRY ST @ BELMONT ST	0		1		22.5	0.7		2		20.6	1.5		1.5		20.5
11 - 5350 - FERRY ST @ BENNETT ST	4		1		25.5	0		0		20.6	1.5		0.5		21.5
12 - 5351 - FERRY ST @ CENTRAL AVE	3		2.5		26	1		2.3		19.3	1		2		20.5
13 - 5352 - FERRY ST @ GLENDALE ST	0.5		1.5		25	1.3		0.3		20.3	0.5		1		20
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0.5		0.5		25	0		0		20.3	0		0.5		19.5
15 - 5354 - FERRY ST @ BROADWAY	6.5		8		23.5	1.7		5.7		16.3	2		2		19.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0.5		23	1		0.3		17	0.5		0.5		19.5
17 - 5490 - BROADWAY @ RAYMOND ST	5		2		26	5.7		0		22.7	2.5		1		21
18 - 5492 - BROADWAY @ HANCOCK ST	4		0.5		29.5	3.7		2.3		24.1	5		3.5		22.5
19 - 5493 - BROADWAY @ PLEASANT ST	3.5		0		33	1		0		25.1	0		0.5		22
20 - 5494 - BROADWAY @ WEBSTER ST	0		0.5		32.5	0		1		24.1	2		0		24
21 - 5495 - BROADWAY @ CHURCH ST	0.5		0.5		32.5	0.3		0.7		23.7	1		0.5		24.5
22 - 5496 - BROADWAY @ NORWOOD ST	8.3		0.7		40.1	2.3		1.3		24.7	1.5		2		24
23 - 5559 - BROADWAY OPP SECOND ST	1.3		1		40.4	1.3		0		26	1		0.5		24.5
24 - 5560 - BROADWAY @ GLADSTONE ST	3.3		0.3		43.4	1.7		1.3		26.4	0.5		0		25
25 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0.3		43.4	1.3		0		27.7	0		0		25
26 - 5498 - BROADWAY OPP BEACHAM ST	1.7		1.3		43.8	0.7		0		28.4	2.5		0		27.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	1.3		0.7		44.4	1.3		0		29.7	3		0.5		30
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		44.4	0		0		29.7	0		0		30
29 - 5501 - OPP 173 ALFORD ST	0		0	4	40.4	0		0	4	25.7	0		0	4	26
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		40.4	0		0		25.7	0		0		26
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		40.4	0		0		25.7	0		0		26
32 - 5502 - ALFORD ST @ WEST ST	0		0		40.4	0		0		25.7	0		0		26
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		39.3		1.1	0		33		-7.3	0		28.5		-2.5
Maximum					44.4					29.7					30
Total	67.3		66.2			48.5		56.1			50		52.5		

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	16:25 (104.0) [3] !Fall 2012!					17:00 (104.0) [2] !Fall 2012!					17:30 (104.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	9.8	8	0		17.8	8.5	3	0		11.5	12	3	0		15
2 - 5289 - CENTRE ST @ STOP & SHOP	3.4		0		21.2	4.5		0		16	3		1		17
3 - 5342 - MAIN ST OPP PLEASANT ST	1.6		0.4		22.4	1		0		17	1.8		0		18.8
4 - 5343 - FERRY ST @ CENTRE ST	0		1		21.4	0		0		17	0.3		0.3		18.8
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		21.4	0.5		0		17.5	0		2		16.8
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.3		3.3		18.4	1		2		16.5	0		2.7		14.1
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0.3		18.1	0		0.5		16	0.7		1		13.8
8 - 5347 - FERRY ST @ CROSS ST	1		0.3		18.8	0		0		16	0.3		2		12.1
9 - 5348 - FERRY ST @ WINTHROP ST	0		1.3		17.5	0		1		15	0		0.3		11.8
10 - 5349 - FERRY ST @ BELMONT ST	1		0.7		17.8	0		2		13	1		4.3		8.5
11 - 5350 - FERRY ST @ BENNETT ST	0.3		0		18.1	0.5		0		13.5	0		1		7.5
12 - 5351 - FERRY ST @ CENTRAL AVE	1		1.3		17.8	0		0.5		13	0.7		1		7.2
13 - 5352 - FERRY ST @ GLENDALE ST	0		0.3		17.5	1.5		1.5		13	0		1.3		5.9
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		17.5	0		0.5		12.5	0		0.7		5.2
15 - 5354 - FERRY ST @ BROADWAY	4.3		1.7		20.1	7.5		0.5		19.5	2.3		4		3.5
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		20.1	1.5		0		21	0.3		0.3		3.5
17 - 5490 - BROADWAY @ RAYMOND ST	4.7		0.3		24.5	2		2		21	1		1		3.5
18 - 5492 - BROADWAY @ HANCOCK ST	2		1.3		25.2	1.5		0.5		22	0.7		0.7		3.5
19 - 5493 - BROADWAY @ PLEASANT ST	0		0.7		24.5	0		1.5		20.5	1.7		2.7		2.5
20 - 5494 - BROADWAY @ WEBSTER ST	1		0.3		25.2	0.5		0.5		20.5	0		0		2.5
21 - 5495 - BROADWAY @ CHURCH ST	0.7		0.7		25.2	0		0.5		20	0		1.3		1.2
22 - 5496 - BROADWAY @ NORWOOD ST	4.7		1.3		28.6	2		2.5		19.5	5		0.7		5.5
23 - 5559 - BROADWAY OPP SECOND ST	1.7		0.7		29.6	0		0.5		19	1		0		6.5
24 - 5560 - BROADWAY @ GLADSTONE ST	0.3		0		29.9	0		0		19	2		2		6.5
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0.3		29.6	0		0.5		18.5	0		0		6.5
26 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.7		29.2	0.5		0		19	0		0		6.5
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0.7		28.5	0		0.5		18.5	0		0		6.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		28.5	0		0		18.5	0		0		6.5
29 - 5501 - OPP 173 ALFORD ST	0		0	8	20.5	0		0	3	15.5	0		0	3	3.5
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		20.5	0		0		15.5	0		0		3.5
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		20.5	0		0		15.5	0		0		3.5
32 - 5502 - ALFORD ST @ WEST ST	0		0		20.5	0		0		15.5	0		0.3		3.2
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		22.5		-2	0		16		-0.5	0		11.8		-8.6
Maximum					29.9					22					18.8
Total	38.1		40.2			33		33.5			33.8		42.4		

Massachusetts Bay Transportation Authority
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	18:00 (104.0) [2] !Fall 2012!					18:30 (104.0) [3] !Fall 2012!					19:00 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	23	3	0		26	11.3	2	0		13.3	12.5	6	0		18.5
2 - 5289 - CENTRE ST @ STOP & SHOP	3.5		2		27.5	3.3		0.7		15.9	3.5		0.5		21.5
3 - 5342 - MAIN ST OPP PLEASANT ST	1.5		0		29	2		0		17.9	2.5		0.5		23.5
4 - 5343 - FERRY ST @ CENTRE ST	0		0		29	0		0		17.9	0		0		23.5
5 - 5344 - FERRY ST @ EASTERN AVE	0		0.5		28.5	0		0		17.9	1		1		23.5
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		4.5		24.5	0		1		16.9	1		1.5		23
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		2		22.5	0		1.3		15.6	1		0.5		23.5
8 - 5347 - FERRY ST @ CROSS ST	0		0.5		22	1		1		15.6	0.5		3.5		20.5
9 - 5348 - FERRY ST @ WINTHROP ST	1		3		20	1.3		0		16.9	0		0.5		20
10 - 5349 - FERRY ST @ BELMONT ST	0		3		17	0		1.3		15.6	0.5		0		20.5
11 - 5350 - FERRY ST @ BENNETT ST	0.5		1.5		16	0		1		14.6	0		0.5		20
12 - 5351 - FERRY ST @ CENTRAL AVE	0.5		0.5		16	0.7		1.3		14	0		1		19
13 - 5352 - FERRY ST @ GLENDALE ST	2.5		1.5		17	1.3		0.3		15	0		1.5		17.5
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0.5		16.5	0		0		15	0		0		17.5
15 - 5354 - FERRY ST @ BROADWAY	2.5		2.5		16.5	1		3.3		12.7	3.5		3		18
16 - 5489 - BROADWAY @ WAVERLY AVE	2.5		0		19	0.3		0		13	3.5		0		21.5
17 - 5490 - BROADWAY @ RAYMOND ST	1.5		1		19.5	0.7		1.3		12.4	0		0		21.5
18 - 5492 - BROADWAY @ HANCOCK ST	1.5		0.5		20.5	2.3		0.3		14.4	1		2		20.5
19 - 5493 - BROADWAY @ PLEASANT ST	1		1		20.5	1		0.7		14.7	0		1		19.5
20 - 5494 - BROADWAY @ WEBSTER ST	0		0.5		20	0		0.7		14	0.5		0		20
21 - 5495 - BROADWAY @ CHURCH ST	0		1		19	0.7		0.7		14	0		1		19
22 - 5496 - BROADWAY @ NORWOOD ST	3.5		2		20.5	2		1.3		14.7	0.5		0		19.5
23 - 5559 - BROADWAY OPP SECOND ST	1.5		0		22	0.7		1		14.4	1		0.5		20
24 - 5560 - BROADWAY @ GLADSTONE ST	0.5		1		21.5	0.7		0.3		14.8	1		2.5		18.5
25 - 5497 - BROADWAY @ BOWDOIN ST	0.5		2		20	1		0		15.8	2		0		20.5
26 - 5498 - BROADWAY OPP BEACHAM ST	1		0.5		20.5	0		0.7		15.1	0.5		1		20
27 - 5499 - BROADWAY OPP THORNDIKE ST	1		0.5		21	0.7		0.7		15.1	0.5		0		20.5
28 - 5500 - BROADWAY @ HORIZON WAY	1		0		22	0.7		0		15.8	0		0		20.5
29 - 5501 - OPP 173 ALFORD ST	0		0	3	19	0		0	2	13.8	0		0	6	14.5
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		19	0		0		13.8	0		0		14.5
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		19	0		0		13.8	0		0		14.5
32 - 5502 - ALFORD ST @ WEST ST	0		0		19	0		0		13.8	0		0.5		14
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		19		0	0		13.7		0.1	0		14		0
Maximum					29					17.9					23.5
Total	51		51			32.7		32.7			36.5		36.5		

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	19:35 (104.0) [2] !Fall 2012!					20:25 (104.0) [1] !Fall 2012!					21:15 (104.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	13.5	5	0		18.5	16	9	0		25	8	12	0		20
2 - 5289 - CENTRE ST @ STOP & SHOP	2		0.5		20	0		0		25	8		0		28
3 - 5342 - MAIN ST OPP PLEASANT ST	0.5		0		20.5	4		0		29	0		0		28
4 - 5343 - FERRY ST @ CENTRE ST	0.5		0		21	0		0		29	1		0		29
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		21	0		0		29	0		0		29
6 - 5345 - FERRY ST OPP ELMWOOD PK	0.5		1.5		20	1		1		29	2		0		31
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0.5		1.5		19	0		1		28	0		0		31
8 - 5347 - FERRY ST @ CROSS ST	0		1		18	0		2		26	0		0		31
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		18	1		3		24	0		2		29
10 - 5349 - FERRY ST @ BELMONT ST	0		0		18	0		2		22	1		1		29
11 - 5350 - FERRY ST @ BENNETT ST	0		0.5		17.5	0		0		22	0		1		28
12 - 5351 - FERRY ST @ CENTRAL AVE	0.5		0		18	0		1		21	2		4		26
13 - 5352 - FERRY ST @ GLENDALE ST	0		1.5		16.5	0		0		21	0		1		25
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		16.5	0		0		21	0		0		25
15 - 5354 - FERRY ST @ BROADWAY	0		3		13.5	0		5		16	3		3		25
16 - 5489 - BROADWAY @ WAVERLY AVE	0.5		0.5		13.5	0		0		16	0		0		25
17 - 5490 - BROADWAY @ RAYMOND ST	0.5		2		12	1		0		17	2		0		27
18 - 5492 - BROADWAY @ HANCOCK ST	0.5		1		11.5	0		0		17	5		4		28
19 - 5493 - BROADWAY @ PLEASANT ST	0		0		11.5	0		0		17	0		0		28
20 - 5494 - BROADWAY @ WEBSTER ST	0		0.5		11	0		2		15	0		0		28
21 - 5495 - BROADWAY @ CHURCH ST	0		1		10	0		0		15	0		0		28
22 - 5496 - BROADWAY @ NORWOOD ST	0		0		10	0		0		15	6		1		33
23 - 5559 - BROADWAY OPP SECOND ST	0.5		0.5		10	0		0		15	1		0		34
24 - 5560 - BROADWAY @ GLADSTONE ST	0.5		0		10.5	0		2		13	0		0		34
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0.5		10	0		0		13	1		0		35
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		10	0		0		13	2		0		37
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		10	0		0		13	0		0		37
28 - 5500 - BROADWAY @ HORIZON WAY	1		0		11	0		0		13	0		0		37
29 - 5501 - OPP 173 ALFORD ST	0		0	5	6	0		0	9	4	0		0	12	25
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		6	0		0		4	0		0		25
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		6	0		0		4	0		0		25
32 - 5502 - ALFORD ST @ WEST ST	0		0		6	0		0		4	0		1		24
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		6		0	0		4		0	0		24		0
Maximum					21					29					37
Total	21.5		21.5			23		23			42		42		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
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(Urban Transportation Associates)

	22:05 (104.0) [2] !Fall 2012!					22:55 (104.0) [3] !Fall 2012!					23:45 (104.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	7	6	0		13	9.7	5	0		14.7	8.3	9	0		17.3
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		13	0.7		0		15.4	0.3		0		17.6
3 - 5342 - MAIN ST OPP PLEASANT ST	0.5		0		13.5	0		0.3		15.1	0		0		17.6
4 - 5343 - FERRY ST @ CENTRE ST	0		0		13.5	0		0		15.1	0		0		17.6
5 - 5344 - FERRY ST @ EASTERN AVE	0.5		0		14	0		0.7		14.4	0.3		0		17.9
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		1		13	0.7		1.3		13.8	0		1.7		16.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0.5		12.5	0		0.3		13.5	0		0.7		15.5
8 - 5347 - FERRY ST @ CROSS ST	1.5		0.5		13.5	0		0.7		12.8	0		2.3		13.2
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		13.5	0		0.3		12.5	0		1		12.2
10 - 5349 - FERRY ST @ BELMONT ST	1		0		14.5	0.3		1.7		11.1	0		1.3		10.9
11 - 5350 - FERRY ST @ BENNETT ST	0		0		14.5	0.7		0		11.8	0		0		10.9
12 - 5351 - FERRY ST @ CENTRAL AVE	0		2.5		12	0		2		9.8	0		0.3		10.6
13 - 5352 - FERRY ST @ GLENDALE ST	0		0		12	0		0		9.8	0		0.3		10.3
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		12	0		0		9.8	0		0		10.3
15 - 5354 - FERRY ST @ BROADWAY	2.5		1		13.5	0.7		0.7		9.8	1.3		1		10.6
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0		13.5	0		0		9.8	0		0		10.6
17 - 5490 - BROADWAY @ RAYMOND ST	2		0		15.5	1		0.3		10.5	0.7		0.3		11
18 - 5492 - BROADWAY @ HANCOCK ST	0.5		0		16	1.7		1		11.2	0.3		0.3		11
19 - 5493 - BROADWAY @ PLEASANT ST	0.5		0		16.5	0		0		11.2	0		0		11
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		16.5	0		0		11.2	0		0		11
21 - 5495 - BROADWAY @ CHURCH ST	0.5		0		17	0		0		11.2	0		0		11
22 - 5496 - BROADWAY @ NORWOOD ST	0.5		2		15.5	2		0		13.2	0		0.3		10.7
23 - 5559 - BROADWAY OPP SECOND ST	0		0		15.5	0.3		0		13.5	0		0		10.7
24 - 5560 - BROADWAY @ GLADSTONE ST	0.5		0.5		15.5	1		0		14.5	0		0.3		10.4
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0		15.5	0		0		14.5	0		0		10.4
26 - 5498 - BROADWAY OPP BEACHAM ST	1		0.5		16	0		0.3		14.2	0		0		10.4
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0.5		15.5	0		0		14.2	0		0.3		10.1
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		15.5	0.3		0		14.5	0		0		10.1
29 - 5501 - OPP 173 ALFORD ST	0		0	6	9.5	0		0	5	9.5	0		0	9	1.1
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		9.5	0		0		9.5	0		0		1.1
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		9.5	0		0		9.5	0		0		1.1
32 - 5502 - ALFORD ST @ WEST ST	0		0		9.5	0		0		9.5	0		0		1.1
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		9.5		0	0		9.3		0.2	0		1.3		-0.2
Maximum					17					15.4					17.9
Total	18.5		18.5			19		19			11.3		11.7		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	24:35 (104.0) [3] !Fall 2012!					Total				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	11.7	7	0		18.7	286.4		0		286.4
2 - 5289 - CENTRE ST @ STOP & SHOP	0.7		0		19.4	68.9		17.1		338.2
3 - 5342 - MAIN ST OPP PLEASANT ST	0.3		0		19.7	42.2		7.6		372.8
4 - 5343 - FERRY ST @ CENTRE ST	0		0		19.7	1.8		3.6		371
5 - 5344 - FERRY ST @ EASTERN AVE	0		0		19.7	9.6		8.5		372.1
6 - 5345 - FERRY ST OPP ELMWOOD PK	0		0		19.7	19.4		36.3		355.2
7 - 5346 - FERRY ST OPP MAGNOLIA ST	0		0		19.7	17.9		19.2		353.9
8 - 5347 - FERRY ST @ CROSS ST	0.3		1		19	18.3		28.9		343.3
9 - 5348 - FERRY ST @ WINTHROP ST	0		0		19	12.5		21.9		333.9
10 - 5349 - FERRY ST @ BELMONT ST	0		3.7		15.3	33.4		34.3		333
11 - 5350 - FERRY ST @ BENNETT ST	0.7		0		16	22.2		10.9		344.3
12 - 5351 - FERRY ST @ CENTRAL AVE	0		1.3		14.7	30.7		26.6		348.4
13 - 5352 - FERRY ST @ GLENDALE ST	0		0		14.7	27.5		17.2		358.7
14 - 5353 - FERRY ST @ WALNUT ST - GLENDA	0		0		14.7	5.4		4.5		359.6
15 - 5354 - FERRY ST @ BROADWAY	0.3		3.3		11.7	123		72		410.6
16 - 5489 - BROADWAY @ WAVERLY AVE	0		0.3		11.4	32.6		6.9		436.3
17 - 5490 - BROADWAY @ RAYMOND ST	0		0.3		11.1	109.2		17		528.5
18 - 5492 - BROADWAY @ HANCOCK ST	0		0.3		10.8	92.8		24.6		596.7
19 - 5493 - BROADWAY @ PLEASANT ST	0		0.3		10.5	28.5		17.9		607.3
20 - 5494 - BROADWAY @ WEBSTER ST	0		0		10.5	19.1		10.3		616.1
21 - 5495 - BROADWAY @ CHURCH ST	0		1		9.5	24		20.3		619.8
22 - 5496 - BROADWAY @ NORWOOD ST	1		0		10.5	161.6		32.1		749.3
23 - 5559 - BROADWAY OPP SECOND ST	0		0		10.5	33.7		9.2		773.8
24 - 5560 - BROADWAY @ GLADSTONE ST	0		0.7		9.8	39.3		18.6		794.5
25 - 5497 - BROADWAY @ BOWDOIN ST	0		0.7		9.1	18.5		6.3		806.7
26 - 5498 - BROADWAY OPP BEACHAM ST	0		0		9.1	22.8		8.9		820.6
27 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		9.1	21.4		9.5		832.5
28 - 5500 - BROADWAY @ HORIZON WAY	0		0		9.1	6.8		0		839.3
29 - 5501 - OPP 173 ALFORD ST	0		0	7	2.1	0		0		839.3
30 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		2.1	0		0.5		838.8
31 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		2.1	0		0.5		838.3
32 - 5502 - ALFORD ST @ WEST ST	0		0		2.1	0		3.3		835
33 - 2874 - SULLIVAN STATION - UPPER BUSW	0		3		-0.9	0		847.9		-12.9
Maximum					19.7	0		0		1052.4
Total	15		16			1328.5		1342.5		0

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	04:41 (104.0) [2] !Fall 2012!					05:20 (104.0) [3] !Fall 2012!					06:10 (104.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	2.3		0		2.3	4		0		4	15.5		0		15.5
2 - 5504 - ALFORD ST @ MAIN ST	0		0		2.3	0		0		4	0		0		15.5
3 - 5505 - 173 ALFORD ST	0	0	0		2.3	0	0	0		4	0	1	0		16.5
4 - 5506 - BROADWAY @ DEXTER ST	0		0		2.3	0		0		4	0		0		16.5
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		2.3	0		0.3		3.7	0		1		15.5
6 - 5508 - BROADWAY @ LANGDON ST	0		0		2.3	0		0		3.7	1		1.5		15
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		2.3	0		0		3.7	0.5		0.5		15
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0.5		1.8	0.3		0.7		3.3	0		1		14
9 - 5695 - BROADWAY @ EVERETT SQ	0		0		1.8	1		1		3.3	1		2		13
10 - 5510 - BROADWAY @ MANSFIELD ST	0		0		1.8	1		0.3		4	0		0.5		12.5
11 - 5511 - BROADWAY @ SUMMER ST	0		0		1.8	0.3		1		3.3	1		1.5		12
12 - 5513 - BROADWAY @ HIGH ST	0		0		1.8	0		0		3.3	2.5		1		13.5
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0		1.8	0		0		3.3	0		0		13.5
14 - 5517 - BROADWAY @ REED AVE	0		0		1.8	0.3		0.3		3.3	0		0.5		13
15 - 5518 - BROADWAY @ FERRY ST	0		0		1.8	0		0		3.3	4		4.5		12.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0		1.8	0		0		3.3	0		0		12.5
17 - 5356 - FERRY ST @ SHUTE ST	0		0		1.8	0.7		0		4	0		0		12.5
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		0		1.8	0		0		4	0.5		0		13
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		1.8	0		0		4	0		0		13
20 - 5359 - FERRY ST @ RICH ST	0		0		1.8	1.3		0		5.3	2		0.5		14.5
21 - 5360 - FERRY ST @ HARVARD ST	0		0		1.8	1.7		0		7	0.5		0.5		14.5
22 - 5361 - FERRY ST @ CROSS ST	0		0		1.8	1.7		0		8.7	0.5		0		15
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0		1.8	0.7		0		9.4	0		0		15
24 - 5363 - FERRY ST @ HOLYOKE ST	1.5		0		3.3	0.3		0		9.7	0		0		15
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		3.3	0		0		9.7	0		0		15
26 - 5365 - EASTERN AVE @ MAIN ST	0.5		0		3.8	0		0		9.7	0		0		15
27 - 5366 - MAIN ST @ CENTRE ST	0		0		3.8	0		0		9.7	0		0.5		14.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0		3.8	0		2		7.7	0		0		14.5
29 - 9215 - MAIN ST @ SALEM ST	0		0		3.8	0		0.5		7.2	0		0		14.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.5		0		4.3	0		0		7.2	0		0		14.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		4.3	0		0		7.2	0		0		14.5
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4	0	0.3	0		7.3	0	-0.1	0		13.5	1	0
Maximum					4.3					9.7					15
Total	4.8		4.5			13.3		13.5			29		29		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:40 (104.0) [4] !Fall 2012!					07:00 (104.0) [2] !Fall 2012!					07:30 (104.0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	8		0		8	6		0		6	6		0		6
2 - 5504 - ALFORD ST @ MAIN ST	0		0		8	0		0		6	0.4		0.2		6.2
3 - 5505 - 173 ALFORD ST	0	1	0		9	0	2	0		8	0	1	0		7.2
4 - 5506 - BROADWAY @ DEXTER ST	0		0		9	0		0		8	0		0.5		6.7
5 - 5507 - BROADWAY @ THORNDIKE ST	1		0.3		9.7	0		0		8	0.8		1		6.5
6 - 5508 - BROADWAY @ LANGDON ST	0.3		0.3		9.7	0.5		0		8.5	0		0		6.5
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0		10	0		0		8.5	1		0.3		7.2
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0		10	0		0.5		8	0.3		0.8		6.7
9 - 5695 - BROADWAY @ EVERETT SQ	1		1		10	1.5		1.5		8	1.8		0.8		7.7
10 - 5510 - BROADWAY @ MANSFIELD ST	0.5		0.8		9.7	1		0.5		8.5	1.3		0		9
11 - 5511 - BROADWAY @ SUMMER ST	0.3		0.8		9.2	0		0		8.5	0.3		0		9.3
12 - 5513 - BROADWAY @ HIGH ST	0.5		0.5		9.2	0		0.5		8	0.3		0.3		9.3
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0.3		8.9	0.5		0		8.5	0		1.3		8
14 - 5517 - BROADWAY @ REED AVE	0.3		0.8		8.4	0.5		0		9	1.3		0.5		8.8
15 - 5518 - BROADWAY @ FERRY ST	1		1.8		7.6	3		2		10	4		2.8		10
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.3		0		7.9	0.5		0		10.5	0		0		10
17 - 5356 - FERRY ST @ SHUTE ST	2.5		0		10.4	1.5		0		12	0.8		0		10.8
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	2.5		0		12.9	0		0		12	0		0		10.8
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		12.9	0		0		12	0		0		10.8
20 - 5359 - FERRY ST @ RICH ST	1		0.8		13.1	1.5		0		13.5	0.8		0.5		11.1
21 - 5360 - FERRY ST @ HARVARD ST	0.5		0.3		13.3	2.5		0		16	0.5		0		11.6
22 - 5361 - FERRY ST @ CROSS ST	0		0.3		13	0		0		16	0.8		1		11.4
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0.3		12.7	0		0		16	0		0		11.4
24 - 5363 - FERRY ST @ HOLYOKE ST	1		0.3		13.4	1		0		17	1.8		0.5		12.7
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		13.4	0		0		17	0		0		12.7
26 - 5365 - EASTERN AVE @ MAIN ST	0.3		0		13.7	0.5		0.5		17	0		0.8		11.9
27 - 5366 - MAIN ST @ CENTRE ST	0.3		0.3		13.7	0.5		1		16.5	0		1.5		10.4
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.5		13.2	0.5		1.5		15.5	0.3		1.3		9.4
29 - 9215 - MAIN ST @ SALEM ST	0.3		0		13.5	0		1		14.5	0.3		0		9.7
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.3		0		13.8	0		0.5		14	0.5		0		10.2
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.3		13.5	0		0		14	0		0		10.2
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		12.5	1	-3.6E-15	0		11.5	2	0.5	0		12.3	1	-3.1
Maximum					13.8					17					12.7
Total	21.8		21.5			21.5		21			22.7		26		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	08:00 (104.0) [2] !Fall 2012!					08:30 (104.0) [1] !Fall 2012!					09:00 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	12.5		0		12.5	11		0		11	16.5		0		16.5
2 - 5504 - ALFORD ST @ MAIN ST	0		0		12.5	0		0		11	0		0		16.5
3 - 5505 - 173 ALFORD ST	0	2	0		14.5	0	2	0		13	0	5	0		21.5
4 - 5506 - BROADWAY @ DEXTER ST	0		0		14.5	0		1		12	0		0.5		21
5 - 5507 - BROADWAY @ THORNDIKE ST	0.5		0.5		14.5	0		0		12	0		0		21
6 - 5508 - BROADWAY @ LANGDON ST	0		0.5		14	0		1		11	0		1		20
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		14	0		0		11	0		0		20
8 - 5565 - BROADWAY @ GLADSTONE ST	0		2		12	0		1		10	0.5		0		20.5
9 - 5695 - BROADWAY @ EVERETT SQ	0		1		11	3		1		12	3		3		20.5
10 - 5510 - BROADWAY @ MANSFIELD ST	1		0		12	4		0		16	2		2		20.5
11 - 5511 - BROADWAY @ SUMMER ST	1		0.5		12.5	0		0		16	1		0.5		21
12 - 5513 - BROADWAY @ HIGH ST	0		1.5		11	1		1		16	2		1.5		21.5
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0		11	0		2		14	0		0		21.5
14 - 5517 - BROADWAY @ REED AVE	0.5		0.5		11	1		0		15	1		0.5		22
15 - 5518 - BROADWAY @ FERRY ST	4.5		4		11.5	1		0		16	3.5		4		21.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1.5		0		13	0		0		16	0.5		1		21
17 - 5356 - FERRY ST @ SHUTE ST	0.5		0		13.5	0		1		15	1.5		0.5		22
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1		1.5		13	1		0		16	2		1		23
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		13	0		0		16	0		0		23
20 - 5359 - FERRY ST @ RICH ST	0.5		0		13.5	2		0		18	1		1.5		22.5
21 - 5360 - FERRY ST @ HARVARD ST	1.5		0		15	2		1		19	0		0		22.5
22 - 5361 - FERRY ST @ CROSS ST	0		0		15	0		0		19	1.5		0.5		23.5
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0		15	0		0		19	3.5		0.5		26.5
24 - 5363 - FERRY ST @ HOLYOKE ST	1.5		0		16.5	5		0		24	0.5		0		27
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		16.5	0		0		24	0.5		0.5		27
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.5		16	3		1		26	0		0		27
27 - 5366 - MAIN ST @ CENTRE ST	0		1		15	0		0		26	0		1.5		25.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.5		14.5	0		0		26	1		2.5		24
29 - 9215 - MAIN ST @ SALEM ST	0		1		13.5	0		0		26	0.5		1.5		23
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.5		1.5		12.5	0		0		26	0.5		0		23.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		12.5	0		0		26	0		1.5		22
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		10.5	2	0	0		24	2	0	0		16.5	5	0.5
Maximum					16.5					26					27
Total	27		27			34		34			42.5		42		

Massachusetts Bay Transportation Authority

Route 104

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

	09:30 (104.0) [1] !Fall 2012!					10:00 (104.0) [3] !Fall 2012!					10:35 (104.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	7		0		7	13.3		0		13.3	7		0		7
2 - 5504 - ALFORD ST @ MAIN ST	0		0		7	0		0		13.3	1		0		8
3 - 5505 - 173 ALFORD ST	0	4	0		11	0	5	0		18.3	0	5	0		13
4 - 5506 - BROADWAY @ DEXTER ST	0		0		11	0		0		18.3	0		0		13
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		11	0		0		18.3	0		1		12
6 - 5508 - BROADWAY @ LANGDON ST	0		0		11	0		0.7		17.6	0		0		12
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		11	0		0		17.6	0		0		12
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0		11	1		1		17.6	0		0		12
9 - 5695 - BROADWAY @ EVERETT SQ	3		2		12	3		4.3		16.3	0		2		10
10 - 5510 - BROADWAY @ MANSFIELD ST	2		0		14	0.7		0		17	2		1		11
11 - 5511 - BROADWAY @ SUMMER ST	0		0		14	1		1.3		16.7	1		0		12
12 - 5513 - BROADWAY @ HIGH ST	0		0		14	1.3		1.7		16.3	0		1		11
13 - 5514 - BROADWAY @ LEXINGTON ST	0		0		14	0.3		0		16.6	2		1		12
14 - 5517 - BROADWAY @ REED AVE	2		0		16	1.7		2		16.3	0		0		12
15 - 5518 - BROADWAY @ FERRY ST	4		2		18	2.3		1.3		17.3	5		1		16
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1		0		19	0.3		0		17.6	0		0		16
17 - 5356 - FERRY ST @ SHUTE ST	0		0		19	0.7		0		18.3	2		0		18
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	2		0		21	1.3		0		19.6	0		1		17
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		21	1.3		0.3		20.6	0		0		17
20 - 5359 - FERRY ST @ RICH ST	1		0		22	3.7		0		24.3	1		0		18
21 - 5360 - FERRY ST @ HARVARD ST	0		3		19	0.3		0.3		24.3	1		0		19
22 - 5361 - FERRY ST @ CROSS ST	2		0		21	1.7		0.7		25.3	4		0		23
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0		21	0		0.7		24.6	2		0		25
24 - 5363 - FERRY ST @ HOLYOKE ST	2		1		22	1.3		0		25.9	2		0		27
25 - 5364 - FERRY ST @ EASTERN AVE	1		0		23	0		0		25.9	0		0		27
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		23	0		1.7		24.2	0		0		27
27 - 5366 - MAIN ST @ CENTRE ST	0		0		23	0		1.3		22.9	0		2		25
28 - 5342 - MAIN ST OPP PLEASANT ST	2		6		19	0		1.7		21.2	0		9		16
29 - 9215 - MAIN ST @ SALEM ST	0		0		19	0		1		20.2	0		0		16
30 - 19215 - FLORENCE ST @ RAMSDELL RD	3		1		21	0		1.5		18.7	0		0		16
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		21	0		0		18.7	0		0		16
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		17	4	0	0		14.7	5	-1	0		12	5	-1
Maximum					23					25.9					27
Total	32		32			35.3		36.2			30		31		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:10 (104.0) [3] !Fall 2012!					11:45 (104.0) [1] !Fall 2012!					12:20 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	16.3		0		16.3	23		0		23	27		0		27
2 - 5504 - ALFORD ST @ MAIN ST	0.3		0		16.6	0		0		23	0		0		27
3 - 5505 - 173 ALFORD ST	0	5	0		21.6	0	4	0		27	0	5	0		32
4 - 5506 - BROADWAY @ DEXTER ST	0		0		21.6	0		0		27	0		0		32
5 - 5507 - BROADWAY @ THORNDIKE ST	0		1.3		20.3	0		0		27	1		0		33
6 - 5508 - BROADWAY @ LANGDON ST	1.7		0.7		21.3	0		2		25	0		1		32
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		21.3	0		0		25	0		0		32
8 - 5565 - BROADWAY @ GLADSTONE ST	0.7		3		19	0		1		24	0.5		0.5		32
9 - 5695 - BROADWAY @ EVERETT SQ	5		1.7		22.3	0		3		21	7		3.5		35.5
10 - 5510 - BROADWAY @ MANSFIELD ST	1.7		2		22	1		3		19	1		1		35.5
11 - 5511 - BROADWAY @ SUMMER ST	2.3		2		22.3	1		1		19	0		0.5		35
12 - 5513 - BROADWAY @ HIGH ST	1.3		3.7		19.9	1		1		19	2		3		34
13 - 5514 - BROADWAY @ LEXINGTON ST	0.3		1.3		18.9	0		0		19	0.5		5		29.5
14 - 5517 - BROADWAY @ REED AVE	3		2		19.9	0		0		19	0.5		1		29
15 - 5518 - BROADWAY @ FERRY ST	3		1.7		21.2	0		7		12	2		9.5		21.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1		0		22.2	4		0		16	1.5		1		22
17 - 5356 - FERRY ST @ SHUTE ST	2.3		0		24.5	3		1		18	0		1.5		20.5
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	1		2		23.5	0		0		18	1		0		21.5
19 - 5358 - FERRY ST @ COOLIDGE ST	0.3		0.7		23.1	0		1		17	2		0.5		23
20 - 5359 - FERRY ST @ RICH ST	2.7		2.7		23.1	0		2		15	0		0		23
21 - 5360 - FERRY ST @ HARVARD ST	2.3		0		25.4	0		0		15	3		0		26
22 - 5361 - FERRY ST @ CROSS ST	0.3		0		25.7	0		0		15	1		0		27
23 - 5362 - FERRY ST @ MAGNOLIA ST	3.7		0		29.4	1		0		16	0.5		0.5		27
24 - 5363 - FERRY ST @ HOLYOKE ST	0.3		0		29.7	0		0		16	2		0		29
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		29.7	0		0		16	0		0		29
26 - 5365 - EASTERN AVE @ MAIN ST	0		6.3		23.4	0		0		16	0		1		28
27 - 5366 - MAIN ST @ CENTRE ST	0		0.3		23.1	0		2		14	1.5		5		24.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0		2.7		20.4	1		3		12	1		1		24.5
29 - 9215 - MAIN ST @ SALEM ST	0.5		0		20.9	1		0		13	0		0		24.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		20.9	0		0		13	0		0		24.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		20.9	0		0		13	0		0		24.5
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		15.7	5	0.2	0		9	4	0	0		18.5	5	1
Maximum					29.7					27					35.5
Total	50.2		49.7			36		36			55		54		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	12:55 (104.0) [1] !Fall 2012!					13:30 (104.0) [2] !Fall 2012!					14:05 (104.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	33		0		33	13.3		0		13.3	22.3		0		22.3
2 - 5504 - ALFORD ST @ MAIN ST	0		0		33	1		0		14.3	1		0		23.3
3 - 5505 - 173 ALFORD ST	0	5	0		38	0	9	0		23.3	0	4	0		27.3
4 - 5506 - BROADWAY @ DEXTER ST	0		0		38	0		1		22.3	0		0		27.3
5 - 5507 - BROADWAY @ THORNDIKE ST	1		0		39	1.5		1		22.8	0.7		0.7		27.3
6 - 5508 - BROADWAY @ LANGDON ST	0		2		37	0		0.5		22.3	0		2.3		25
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		1		36	0.5		0		22.8	0		0.3		24.7
8 - 5565 - BROADWAY @ GLADSTONE ST	1		0		37	0		1		21.8	0		1.7		23
9 - 5695 - BROADWAY @ EVERETT SQ	0		7		30	1.5		4		19.3	3.7		3		23.7
10 - 5510 - BROADWAY @ MANSFIELD ST	4		0		34	0		1.5		17.8	0		0.3		23.4
11 - 5511 - BROADWAY @ SUMMER ST	2		1		35	1		0		18.8	1		0.5		23.9
12 - 5513 - BROADWAY @ HIGH ST	0		2		33	0		0.5		18.3	1.5		2.5		22.9
13 - 5514 - BROADWAY @ LEXINGTON ST	0		7		26	0		0		18.3	0		2.5		20.4
14 - 5517 - BROADWAY @ REED AVE	1		3		24	0		1		17.3	1.5		3.5		18.4
15 - 5518 - BROADWAY @ FERRY ST	7		5		26	1.5		7		11.8	7.5		3.5		22.4
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1		2		25	0		0		11.8	0		2		20.4
17 - 5356 - FERRY ST @ SHUTE ST	3		0		28	1		0.5		12.3	1		0.5		20.9
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	2		5		25	0		0.5		11.8	0		0.5		20.4
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		25	0		0		11.8	0		0.5		19.9
20 - 5359 - FERRY ST @ RICH ST	1		3		23	2.5		0		14.3	4		0		23.9
21 - 5360 - FERRY ST @ HARVARD ST	3		0		26	0		1.5		12.8	0.5		0.5		23.9
22 - 5361 - FERRY ST @ CROSS ST	1		0		27	2.5		2		13.3	2.5		1.5		24.9
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		1		26	1.5		1.5		13.3	1.8		1.5		25.2
24 - 5363 - FERRY ST @ HOLYOKE ST	1		1		26	0.5		0		13.8	0		0.3		24.9
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		26	0		0		13.8	0		0		24.9
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		26	0		0		13.8	0		0		24.9
27 - 5366 - MAIN ST @ CENTRE ST	0		3		23	0		4		9.8	0		0.7		24.2
28 - 5342 - MAIN ST OPP PLEASANT ST	1		10		14	0		1		8.8	0.3		3.3		21.2
29 - 9215 - MAIN ST @ SALEM ST	0		0		14	0		0		8.8	0		0		21.2
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		14	0		0		8.8	1.7		0		22.9
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		14	0		0		8.8	0		0		22.9
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		8	5	1	0		14.3	9	-14.5	0		16.7	4	2.2
Maximum					39					23.3					27.3
Total	62		61			28.3		42.8			50.9		48.8		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	14:40 (104.0) [3] !Fall 2012!					15:15 (104.0) [2] !Fall 2012!					15:50 (104.0) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	29.3		0		29.3	33.5		0		33.5	38.5		0		38.5
2 - 5504 - ALFORD ST @ MAIN ST	0		0.3		29	0		0		33.5	0.3		0		38.8
3 - 5505 - 173 ALFORD ST	0	5	0		34	0	4	0		37.5	0	4	0		42.8
4 - 5506 - BROADWAY @ DEXTER ST	0		0		34	0		0.5		37	0		0		42.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0.3		0		34.3	0		1.5		35.5	0.7		1.3		42.2
6 - 5508 - BROADWAY @ LANGDON ST	0		0		34.3	0.5		1		35	0.3		0		42.5
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.7		33.6	0		0.5		34.5	0.3		0.3		42.5
8 - 5565 - BROADWAY @ GLADSTONE ST	1.3		2.7		32.2	0		0.5		34	0.7		1		42.2
9 - 5695 - BROADWAY @ EVERETT SQ	2		3		31.2	4		3		35	2.3		4		40.5
10 - 5510 - BROADWAY @ MANSFIELD ST	1.7		0.3		32.6	0		0.5		34.5	0.3		1.7		39.1
11 - 5511 - BROADWAY @ SUMMER ST	0		1		31.6	0		2		32.5	0.3		3.7		35.7
12 - 5513 - BROADWAY @ HIGH ST	0.3		1.3		30.6	1		1.5		32	2		3		34.7
13 - 5514 - BROADWAY @ LEXINGTON ST	0.3		1		29.9	1		1.5		31.5	1.3		3.7		32.3
14 - 5517 - BROADWAY @ REED AVE	0.7		0.7		29.9	1.5		0.5		32.5	0		2		30.3
15 - 5518 - BROADWAY @ FERRY ST	2.3		7.7		24.5	4		13		23.5	1.3		5.3		26.3
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0.7		0.3		24.9	0.5		1.5		22.5	0.3		0.3		26.3
17 - 5356 - FERRY ST @ SHUTE ST	1		0.7		25.2	0.5		1.5		21.5	0		1.3		25
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		2.7		22.5	1.5		0		23	0		1		24
19 - 5358 - FERRY ST @ COOLIDGE ST	0.3		0		22.8	1		0		24	1		1.3		23.7
20 - 5359 - FERRY ST @ RICH ST	0.3		0.7		22.4	5		0		29	0		0		23.7
21 - 5360 - FERRY ST @ HARVARD ST	0		1		21.4	4		0		33	0.3		0.7		23.3
22 - 5361 - FERRY ST @ CROSS ST	0.7		0.3		21.8	1.5		1		33.5	0.3		0		23.6
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0		21.8	0		0		33.5	0.3		0.7		23.2
24 - 5363 - FERRY ST @ HOLYOKE ST	0		1		20.8	1.5		0.5		34.5	0		0		23.2
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		20.8	1.5		0.5		35.5	0		1		22.2
26 - 5365 - EASTERN AVE @ MAIN ST	0		1		19.8	0		1		34.5	0		1.7		20.5
27 - 5366 - MAIN ST @ CENTRE ST	1.3		2.7		18.4	0		0.5		34	0		1		19.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.7		17.7	0		2		32	0		3.7		15.8
29 - 9215 - MAIN ST @ SALEM ST	1.3		0		19	0		0		32	0		0.3		15.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.3		0.3		19	2.5		1		33.5	0.7		0.7		15.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.3		18.7	0		0		33.5	0		0		15.5
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		15.3	5	-1.6	0		27	4	2.5	0		16.8	4	-5.3
Maximum					34.3					37.5					42.8
Total	44.3		45.6			65		62.5			51.5		56.4		

Massachusetts Bay Transportation Authority
Route 104
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	16:25 (104.0) [2] !Fall 2012!					17:00 (104.0) [3] !Fall 2012!					17:30 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	40		0		40	41.3		0		41.3	35		0		35
2 - 5504 - ALFORD ST @ MAIN ST	0.5		0		40.5	0.7		0		42	0		0		35
3 - 5505 - 173 ALFORD ST	0	8	0		48.5	0	3	0		45	0	3	0		38
4 - 5506 - BROADWAY @ DEXTER ST	0		0		48.5	0		0.3		44.7	0		0.5		37.5
5 - 5507 - BROADWAY @ THORNDIKE ST	0		1		47.5	0.3		0.3		44.7	0		2.5		35
6 - 5508 - BROADWAY @ LANGDON ST	0		1		46.5	0.3		0		45	0		0		35
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		1		45.5	0		0		45	1		0		36
8 - 5565 - BROADWAY @ GLADSTONE ST	0		3.5		42	0.7		1.7		44	1		0.5		36.5
9 - 5695 - BROADWAY @ EVERETT SQ	6.5		6		42.5	2		2		44	2.5		4.5		34.5
10 - 5510 - BROADWAY @ MANSFIELD ST	2.5		4		41	1		1.3		43.7	0.5		0		35
11 - 5511 - BROADWAY @ SUMMER ST	1		1.5		40.5	0.7		2		42.4	0		1		34
12 - 5513 - BROADWAY @ HIGH ST	1		3.5		38	0.3		4		38.7	1.5		1.5		34
13 - 5514 - BROADWAY @ LEXINGTON ST	0		3		35	0		4		34.7	0		3		31
14 - 5517 - BROADWAY @ REED AVE	0		2		33	1		4.3		31.4	0		2		29
15 - 5518 - BROADWAY @ FERRY ST	3.5		9		27.5	1.3		6.7		26	1		8.5		21.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		2		25.5	0.3		0		26.3	0		0.5		21
17 - 5356 - FERRY ST @ SHUTE ST	0.5		2		24	0.3		2		24.6	0		0.5		20.5
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		0.5		23.5	0.3		1.7		23.2	1		3		18.5
19 - 5358 - FERRY ST @ COOLIDGE ST	0		1		22.5	0.7		1		22.9	0		3		15.5
20 - 5359 - FERRY ST @ RICH ST	1		0.5		23	0.7		1.7		21.9	0		3.5		12
21 - 5360 - FERRY ST @ HARVARD ST	0		0		23	0		1.3		20.6	1		0		13
22 - 5361 - FERRY ST @ CROSS ST	0		1		22	0.7		0		21.3	1		1		13
23 - 5362 - FERRY ST @ MAGNOLIA ST	0.5		0.5		22	1		1		21.3	0		0		13
24 - 5363 - FERRY ST @ HOLYOKE ST	0		2		20	0		1		20.3	1.5		0		14.5
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		20	0		0		20.3	0		0		14.5
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		20	0		1.3		19	0		0		14.5
27 - 5366 - MAIN ST @ CENTRE ST	0		4		16	0.3		1.3		18	0		0.5		14
28 - 5342 - MAIN ST OPP PLEASANT ST	0		1		15	0.7		0.3		18.4	0		2		12
29 - 9215 - MAIN ST @ SALEM ST	0		0		15	0		3.3		15.1	0		0		12
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0.5		1.5		14	0		0		15.1	0		0		12
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		1.5		12.5	0		0		15.1	0		0		12
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4	8	0.5	0		15.3	3	-3.2	0		9	3	0
Maximum					48.5					45					38
Total	57.5		57			54.6		57.9			47		47		

Massachusetts Bay Transportation Authority
Route 104
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Fall 2012
(Urban Transportation Associates)

	18:00 (104.0) [3] !Fall 2012!					18:30 (104.0) [2] !Fall 2012!					19:10 (104.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	26.7		0		26.7	37		0		37	30.5		0		30.5
2 - 5504 - ALFORD ST @ MAIN ST	0.7		0		27.4	0		0		37	0		0.5		30
3 - 5505 - 173 ALFORD ST	0	3	0		30.4	0	4	0		41	0	5	0		35
4 - 5506 - BROADWAY @ DEXTER ST	0		0.3		30.1	0		0		41	0		0		35
5 - 5507 - BROADWAY @ THORNDIKE ST	0		1		29.1	0		0.5		40.5	0.5		1.5		34
6 - 5508 - BROADWAY @ LANGDON ST	2.3		0		31.4	0		0.5		40	0		0		34
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.3		31.1	1		0		41	0		0		34
8 - 5565 - BROADWAY @ GLADSTONE ST	0		0		31.1	0.5		2.5		39	1		2		33
9 - 5695 - BROADWAY @ EVERETT SQ	2		3		30.1	0		10		29	1		4.5		29.5
10 - 5510 - BROADWAY @ MANSFIELD ST	0.3		1.3		29.1	1.5		3		27.5	0		1.5		28
11 - 5511 - BROADWAY @ SUMMER ST	0.3		3		26.4	0.5		0		28	0.5		1		27.5
12 - 5513 - BROADWAY @ HIGH ST	1		3.3		24.1	0		3.5		24.5	0.5		2		26
13 - 5514 - BROADWAY @ LEXINGTON ST	0		1.7		22.4	0		1.5		23	0		0.5		25.5
14 - 5517 - BROADWAY @ REED AVE	0		3		19.4	0		2		21	0		1		24.5
15 - 5518 - BROADWAY @ FERRY ST	1.7		4.7		16.4	1		5.5		16.5	1.5		6		20
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	1		1		16.4	1		1		16.5	1		2		19
17 - 5356 - FERRY ST @ SHUTE ST	0.3		2		14.7	0		1.5		15	0		1		18
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		1.3		13.4	0		1.5		13.5	0		0.5		17.5
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		13.4	0		2.5		11	0		0		17.5
20 - 5359 - FERRY ST @ RICH ST	1		2		12.4	0		1.5		9.5	1		2		16.5
21 - 5360 - FERRY ST @ HARVARD ST	0		0.3		12.1	0		0		9.5	0		2		14.5
22 - 5361 - FERRY ST @ CROSS ST	1		0.7		12.4	0		0		9.5	0		0.5		14
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		0.7		11.7	0		1		8.5	0		1		13
24 - 5363 - FERRY ST @ HOLYOKE ST	0		1		10.7	1		0		9.5	0		1.5		11.5
25 - 5364 - FERRY ST @ EASTERN AVE	0		0		10.7	0		0		9.5	0		0.5		11
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		10.7	0		0		9.5	0		0		11
27 - 5366 - MAIN ST @ CENTRE ST	0		0.3		10.4	0		0		9.5	0		0		11
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.7		9.7	0		0		9.5	0		1.5		9.5
29 - 9215 - MAIN ST @ SALEM ST	0		0		9.7	0		1		8.5	0		0		9.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		1.3		8.4	0		1		7.5	0		1.5		8
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.7		7.7	0		0		7.5	0		1		7
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4.7	3	-5.3E-15	0		3.5	4	0	0		2	5	0
Maximum					31.4					41					35
Total	38.3		38.3			43.5		43.5			37.5		37.5		

Massachusetts Bay Transportation Authority
Route 104
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	20:00 (104.0) [2] !Fall 2012!					20:50 (104.0) [1] !Fall 2012!					21:40 (104.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	27.5		0		27.5	27		0		27	26.5		0		26.5
2 - 5504 - ALFORD ST @ MAIN ST	0		0		27.5	0		0		27	0		0		26.5
3 - 5505 - 173 ALFORD ST	0	3	0		30.5	0	2	0		29	0	7	0		33.5
4 - 5506 - BROADWAY @ DEXTER ST	0		0		30.5	0		0		29	0		0		33.5
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0.5		30	0		3		26	0		0		33.5
6 - 5508 - BROADWAY @ LANGDON ST	0		0		30	0		0		26	0.5		0.5		33.5
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		30	1		4		23	0		0		33.5
8 - 5565 - BROADWAY @ GLADSTONE ST	0		1		29	0		3		20	0.5		1		33
9 - 5695 - BROADWAY @ EVERETT SQ	0		2		27	0		0		20	0		3		30
10 - 5510 - BROADWAY @ MANSFIELD ST	0		3		24	0		4		16	0.5		0		30.5
11 - 5511 - BROADWAY @ SUMMER ST	0		0		24	1		1		16	0		0		30.5
12 - 5513 - BROADWAY @ HIGH ST	1.5		0		25.5	0		0		16	1		5		26.5
13 - 5514 - BROADWAY @ LEXINGTON ST	0.5		0.5		25.5	0		0		16	0		1		25.5
14 - 5517 - BROADWAY @ REED AVE	2		0.5		27	0		5		11	0		2.5		23
15 - 5518 - BROADWAY @ FERRY ST	3.5		5.5		25	2		3		10	0.5		6		17.5
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0.5		24.5	0		1		9	1.5		0		19
17 - 5356 - FERRY ST @ SHUTE ST	0.5		0.5		24.5	0		0		9	0		1		18
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		1.5		23	0		1		8	1		0		19
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		23	0		0		8	0.5		0		19.5
20 - 5359 - FERRY ST @ RICH ST	0.5		2		21.5	1		1		8	2		5.5		16
21 - 5360 - FERRY ST @ HARVARD ST	0		2		19.5	0		0		8	0		0		16
22 - 5361 - FERRY ST @ CROSS ST	0.5		2.5		17.5	0		0		8	1		2		15
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		1		16.5	0		0		8	0		0		15
24 - 5363 - FERRY ST @ HOLYOKE ST	0		1.5		15	0		1		7	1		0.5		15.5
25 - 5364 - FERRY ST @ EASTERN AVE	0		0.5		14.5	1		0		8	0		0		15.5
26 - 5365 - EASTERN AVE @ MAIN ST	0		0.5		14	0		0		8	0		1.5		14
27 - 5366 - MAIN ST @ CENTRE ST	0		0		14	0		0		8	0		0.5		13.5
28 - 5342 - MAIN ST OPP PLEASANT ST	0.5		2.5		12	0		0		8	0		1		12.5
29 - 9215 - MAIN ST @ SALEM ST	0		0		12	0		0		8	0		1		11.5
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		12	0		0		8	0		1		10.5
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		12	0		0		8	0		0		10.5
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		9	3	0	0		6	2	0	0		3.5	7	0
Maximum					30.5					29					33.5
Total	37		37			33		33			36.5		36.5		

Massachusetts Bay Transportation Authority

Route 104

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	22:30 (104.0) [3] !Fall 2012!					23:20 (104.0) [3] !Fall 2012!					24:15 (104.0) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	25.3		0		25.3	49.7		0		49.7	48		0		48
2 - 5504 - ALFORD ST @ MAIN ST	0		0		25.3	0		0		49.7	0		0		48
3 - 5505 - 173 ALFORD ST	0	7	0		32.3	0	7	0		56.7	0	5	0		53
4 - 5506 - BROADWAY @ DEXTER ST	0		0		32.3	0		0		56.7	0		0		53
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0.7		31.6	1		0.3		57.4	0.7		2.7		51
6 - 5508 - BROADWAY @ LANGDON ST	10		0.7		40.9	0		0		57.4	0		0		51
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.7		40.5	0		0		57.4	0		0		51
8 - 5565 - BROADWAY @ GLADSTONE ST	0.3		1.7		39.1	0		1		56.4	0.3		4.3		47
9 - 5695 - BROADWAY @ EVERETT SQ	0.7		5		34.8	0.7		2.7		54.4	0.3		2		45.3
10 - 5510 - BROADWAY @ MANSFIELD ST	0.3		1.3		33.8	0		1.7		52.7	0.7		4.7		41.3
11 - 5511 - BROADWAY @ SUMMER ST	0		4.3		29.5	0.7		3.7		49.7	1.7		1.7		41.3
12 - 5513 - BROADWAY @ HIGH ST	0.3		5		24.8	0.3		8.3		41.7	0		3.3		38
13 - 5514 - BROADWAY @ LEXINGTON ST	0		2.7		22.1	0		4		37.7	0		4		34
14 - 5517 - BROADWAY @ REED AVE	9		1		30.1	0		3		34.7	0		4		30
15 - 5518 - BROADWAY @ FERRY ST	0.3		9		21.4	0.7		11.7		23.7	1		8		23
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	0		0.7		20.7	0.3		0		24	0		0		23
17 - 5356 - FERRY ST @ SHUTE ST	0		2.3		18.4	0		2		22	0		2		21
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	0		2		16.4	0		1		21	0		2		19
19 - 5358 - FERRY ST @ COOLIDGE ST	0		0		16.4	0		0.3		20.7	0		1.7		17.3
20 - 5359 - FERRY ST @ RICH ST	0.3		2.7		14	0.7		1.7		19.7	0		2		15.3
21 - 5360 - FERRY ST @ HARVARD ST	0		0		14	0		1		18.7	0.7		1.3		14.7
22 - 5361 - FERRY ST @ CROSS ST	0		0.3		13.7	1		3.7		16	0		1.7		13
23 - 5362 - FERRY ST @ MAGNOLIA ST	0		1.3		12.4	0		0.3		15.7	0		1.3		11.7
24 - 5363 - FERRY ST @ HOLYOKE ST	0		1.3		11.1	0		0.7		15	0		0.7		11
25 - 5364 - FERRY ST @ EASTERN AVE	0		1		10.1	0		0		15	0		0		11
26 - 5365 - EASTERN AVE @ MAIN ST	0		0		10.1	0		1.3		13.7	0		0.7		10.3
27 - 5366 - MAIN ST @ CENTRE ST	0		0		10.1	0		1.3		12.4	1		1.7		9.6
28 - 5342 - MAIN ST OPP PLEASANT ST	0		0.7		9.4	0.3		1		11.7	0		0		9.6
29 - 9215 - MAIN ST @ SALEM ST	0		0		9.4	0		0.7		11	0		0		9.6
30 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0.3		9.1	0		0		11	0		0.7		8.9
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		9.1	0		0		11	0		0		8.9
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		2.3	7	-0.2	0		3.7	7	0.3	0		3	5	0.9
Maximum					40.9					57.4					53
Total	47		47			55.3		55			54.3		53.3		

Massachusetts Bay Transportation Authority

Route 104

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	Total On	Total Off	Total Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	759.8	0	759.8
2 - 5504 - ALFORD ST @ MAIN ST	5.9	1	764.7
3 - 5505 - 173 ALFORD ST	0	0	894.7
4 - 5506 - BROADWAY @ DEXTER ST	0	4.6	890.1
5 - 5507 - BROADWAY @ THORNDIKE ST	10	23.9	876.2
6 - 5508 - BROADWAY @ LANGDON ST	17.4	17.2	876.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	5.9	9.6	872.7
8 - 5565 - BROADWAY @ GLADSTONE ST	10.6	41.1	842.2
9 - 5695 - BROADWAY @ EVERETT SQ	59.5	96.5	805.2
10 - 5510 - BROADWAY @ MANSFIELD ST	32.5	41.2	796.5
11 - 5511 - BROADWAY @ SUMMER ST	19.9	36.5	779.9
12 - 5513 - BROADWAY @ HIGH ST	24.1	66.9	737.1
13 - 5514 - BROADWAY @ LEXINGTON ST	6.7	52.5	691.3
14 - 5517 - BROADWAY @ REED AVE	28.8	49.1	671
15 - 5518 - BROADWAY @ FERRY ST	78.9	166.7	583.2
16 - 5355 - 381 FERRY ST OPP WALNUT ST -	18.2	16.8	584.6
17 - 5356 - FERRY ST @ SHUTE ST	23.6	25.3	582.9
18 - 5357 - FERRY ST @ ROCK VALLEY AVE	18.1	31.2	569.8
19 - 5358 - FERRY ST @ COOLIDGE ST	7.1	13.8	563.1
20 - 5359 - FERRY ST @ RICH ST	39.5	37.8	564.8
21 - 5360 - FERRY ST @ HARVARD ST	25.3	16.7	573.4
22 - 5361 - FERRY ST @ CROSS ST	27.2	20.7	579.9
23 - 5362 - FERRY ST @ MAGNOLIA ST	16.5	14.8	581.6
24 - 5363 - FERRY ST @ HOLYOKE ST	26.7	15.8	592.5
25 - 5364 - FERRY ST @ EASTERN AVE	4	4	592.5
26 - 5365 - EASTERN AVE @ MAIN ST	4.3	20.8	576
27 - 5366 - MAIN ST @ CENTRE ST	4.9	37.9	543
28 - 5342 - MAIN ST OPP PLEASANT ST	8.6	63.1	488.5
29 - 9215 - MAIN ST @ SALEM ST	3.9	11.3	481.1
30 - 19215 - FLORENCE ST @ RAMSDELL RD	11	13.8	478.3
31 - 5369 - FLORENCE ST @ WASHINGTON ST	0	5.3	473
32 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0	363.1	-20.1
Maximum	0	0	997.5
Total	1298.6	1317.5	0

Massachusetts Bay Transportation Authority
Route 105
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	05:00 (105.1) [3] !Fall 2012!					06:00 (105.1) [8] !Fall 2012!					06:30 (105.1) [4] !Fall 2012!					07:10 (105.1) [3] !Fall 2012!					
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	2.3	0	0		2.3	2.4	0	0		2.4	2.5	0	0		2.5	3.3	1	0		4.3	7.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		2.3	0		0		2.4	0		0		2.5	0		0		4.3	0.8
3 - 5373 - 310 MAIN ST	0.3		0		2.6	0		0		2.4	0		0		2.5	0		0		4.3	0
4 - 5375 - EASTERN AVE @ FERRY ST	2.3		0		4.9	0		0		2.4	0		0		2.5	0		0		4.3	0.1
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0		0		4.9	0.3		0.1		2.6	0		0		2.5	0		0		4.3	0
6 - 5377 - EASTERN AVE @ FRANKLIN ST	0.3		0		5.2	0		0		2.6	0		0		2.5	0		1.3		3	0
7 - 5378 - 435 EASTERN AVE	0		0		5.2	0		0.1		2.5	0		0.8		1.7	0		0		3	0
8 - 45378 - LYME ST @ BRYANT ST	0.7		0		5.9	1.6		0		4.1	0		0		1.7	0		0		3	0
9 - 5379 - 210 LYME ST	0		0		5.9	0.4		0		4.5	0		0		1.7	1.3		0		4.3	0.2
10 - 5380 - WILLOW ST @ DANIELS ST	0		0.7		5.2	0.5		0.1		4.9	0		0		1.7	1.7		0.3		5.7	0.1
11 - 5381 - 23 BOWDOIN ST	1.7		0		6.9	0		0		4.9	0		0		1.7	0.3		0		6	0
12 - 5382 - 91 BOWDOIN ST	0		0		6.9	1.5		0.1		6.3	1		0		2.7	1.7		1		6.7	0.6
13 - 5383 - BOWDOIN ST @ NEWLAND ST	1.3		0		8.2	0.6		0.1		6.8	4		0.3		6.4	1.7		0.3		8.1	0.7
14 - 5384 - NEWLAND ST @ ALDEN ST	1		0		9.2	0		0		6.8	2		0		8.4	8		0		16.1	2.4
15 - 5385 - NEWLAND ST @ BRYANT ST	1		0		10.2	0.1		0		6.9	0.5		0.5		8.4	1		0		17.1	1.2
16 - 5386 - BRYANT ST @ HARVARD ST	0		0		10.2	0.6		0		7.5	0.8		0		9.2	0		0		17.1	0.2
17 - 5387 - BRYANT ST @ WILLOW ST	2		0		12.2	0.6		0		8.1	2.3		0		11.5	0.7		0		17.8	0.5
18 - 5388 - CROSS ST @ HENRY ST	1.7		0		13.9	1.1		0		9.2	0		0		11.5	0		0		17.8	0.1
19 - 5389 - CROSS ST @ FERRY ST	2.3		0		16.2	0.8		0		10	0		0.8		10.7	0.3		8		10.1	0
20 - 5391 - CROSS ST @ WALNUT ST	1.7		0		17.9	0		0.1		9.9	0		0		10.7	0		0.3		9.8	0.2
21 - 5392 - CROSS ST @ PELHAM ST	1.7		0		19.6	0.1		0		10	0		0		10.7	0		0		9.8	0
22 - 5393 - CROSS ST @ HIGH ST	0		0		19.6	0		0		10	0		0		10.7	0.3		0		10.1	0.2
23 - 5394 - CROSS ST @ MAIN ST	0		0.7		18.9	0		0		10	0		0		10.7	0		0.7		9.4	0.4
24 - 5395 - MAIN ST @ CONVERSE AVE	1		0		19.9	1		0		11	0		0		10.7	0.3		0		9.7	0.4
25 - 5396 - MAIN ST @ PIERCE AVE	1.7		0		21.6	2.4		0		13.4	0		0		10.7	0		0		9.7	0.8
26 - 5397 - MAIN ST @ FLOYD ST	2.3		0		23.9	0.3		0		13.7	0		0		10.7	1.3		0		11	0.8
27 - 5398 - MAIN ST @ EVERETT ST	2.3		0		26.2	2.1		0		15.8	0		0		10.7	1.7		0		12.7	2.6
28 - 5399 - MAIN ST @ PRESCOTT ST	0.7		0		26.9	0.5		0		16.3	1.3		0		12	0.7		0		13.4	2.1
29 - 5400 - MAIN ST @ BALDWIN AVE	2.7		0		29.6	0.5		0		16.8	0.5		0		12.5	1		0		14.4	0.5
30 - 5401 - 202 MAIN ST	0.3		0		29.9	0.4		0		17.2	0.5		0		13	0		0		14.4	0.2
31 - 5402 - MAIN ST @ PARLIN ST	0		0		29.9	0.1		0		17.3	1.8		0		14.8	0		0		14.4	0
32 - 5403 - MAIN ST @ TILESTON ST	0.3		0		30.2	0.3		0		17.6	0		0		14.8	0		0		14.4	0.5
33 - 5404 - MAIN ST @ WEST ST	4		0		34.2	0.1		0		17.7	0		0		14.8	0		1.7		12.7	0.5
34 - 5497 - BROADWAY @ BOWDOIN ST	1.7		0		35.9	0.1		0		17.8	1		0		15.8	0.7		0.3		13.1	1.2
35 - 5498 - BROADWAY OPP BEACHAM ST	0		0		35.9	1.4		0		19.2	1.3		0		17.1	0.7		0		13.8	0.2
36 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		36.9	0.8		0		20	0		0		17.1	2.3		0		16.1	1.6
37 - 5500 - BROADWAY @ HORIZON WAY	0		0		36.9	0		0		20	0.3		0		17.4	1		0		17.1	0.3
38 - 5501 - OPP 173 ALFORD ST	0		0	0	36.9	0		0	0	20	0		0	0	17.4	0		0	1	16.1	0
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		36.9	0		0		20	0		0		17.4	0		0		16.1	0
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		36.9	0		0		20	0		0		17.4	0		0		16.1	0
41 - 5502 - ALFORD ST @ WEST ST	0		0		36.9	0		1.1		18.9	0		0		17.4	0		0		16.1	0
42 - 2874 - SULLIVAN STATION - UPPER BUSW	0		37		-0.1	0		18.6		0.3	0		17.3		0.1	0		16		0.1	0
Maximum					36.9					20					17.4					17.8	
Total	38.3		38.3			20.5		20.5			19.5		19.5			30		30			26.9

Massachusetts Bay Transportation Authority
Route 105
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	07:50 (105.1) [10] !Fall 2012!				08:20 (105.1) [10] !Fall 2012!					09:25 (105.1) [4] !Fall 2012!					10:35 (105.1) [4] !Fall 2012!					11:45 (10	
Seq - StopID - Stop Name	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0	0		7.5	3.2	1	0		4.2	7.8	1	0		8.8	8.5	2	0		10.5	11	2
2 - 5289 - CENTRE ST @ STOP & SHOP		0.4		7.9	0.2		0		4.4	1.8		0		10.6	1.5		0.3		11.7	2.7	
3 - 5373 - 310 MAIN ST		0.1		7.8	0.1		0		4.5	0		0		10.6	1.3		0.5		12.5	1.3	
4 - 5375 - EASTERN AVE @ FERRY ST		0.7		7.2	0		0.2		4.3	0		0.3		10.3	0		1		11.5	0.1	
5 - 5376 - EASTERN AVE @ PHILLIPS CT		0.1		7.1	0		0.1		4.2	0		0		10.3	0		0		11.5	0.3	
6 - 5377 - EASTERN AVE @ FRANKLIN ST		4.6		2.5	0		0.1		4.1	0.3		0		10.6	0.8		3.3		9	0	
7 - 5378 - 435 EASTERN AVE		0.2		2.3	0		0		4.1	0		0		10.6	0		0.3		8.7	0.2	
8 - 45378 - LYME ST @ BRYANT ST		0.4		1.9	0.1		0.4		3.8	0		2		8.6	0		0.8		7.9	0.1	
9 - 5379 - 210 LYME ST		0.2		1.9	0.1		0.1		3.8	0		0		8.6	0.3		0		8.2	0.4	
10 - 5380 - WILLOW ST @ DANIELS ST		0.2		1.8	0.6		0.2		4.2	0		0		8.6	0		0		8.2	0.2	
11 - 5381 - 23 BOWDOIN ST		0.2		1.6	0.2		0.2		4.2	0		0.3		8.3	0		0		8.2	0.3	
12 - 5382 - 91 BOWDOIN ST		0.1		2.1	0.3		0.1		4.4	0		0.3		8	1.3		0.8		8.7	0.7	
13 - 5383 - BOWDOIN ST @ NEWLAND ST		0.5		2.3	0.5		0.4		4.5	0		0.8		7.2	1.3		1.3		8.7	0.7	
14 - 5384 - NEWLAND ST @ ALDEN ST		0		4.7	0.9		0.2		5.2	1.8		0.3		8.7	0.8		0.3		9.2	0.6	
15 - 5385 - NEWLAND ST @ BRYANT ST		0.2		5.7	0.3		0.1		5.4	1.5		0.3		9.9	0.8		0.3		9.7	0.4	
16 - 5386 - BRYANT ST @ HARVARD ST		0		5.9	0.2		0.2		5.4	0.5		0		10.4	0.3		0		10	0.1	
17 - 5387 - BRYANT ST @ WILLOW ST		0		6.4	0.8		0.3		5.9	0.8		1		10.2	1		0.3		10.7	1.2	
18 - 5388 - CROSS ST @ HENRY ST		0.1		6.4	0.5		0		6.4	0		0		10.2	0.3		0.5		10.5	0.2	
19 - 5389 - CROSS ST @ FERRY ST		0.1		6.3	0.4		0		6.8	0		0.5		9.7	0.8		0		11.3	1	
20 - 5391 - CROSS ST @ WALNUT ST		0.3		6.2	0.1		0		6.9	1.3		0		11	0.3		0.3		11.3	0.1	
21 - 5392 - CROSS ST @ PELHAM ST		0.1		6.1	0		0		6.9	0.3		0		11.3	1.5		0		12.8	0.4	
22 - 5393 - CROSS ST @ HIGH ST		0		6.3	0.5		0		7.4	0.3		0		11.6	0.3		0		13.1	0	
23 - 5394 - CROSS ST @ MAIN ST		0.1		6.6	0.3		0.5		7.2	0.3		0.5		11.4	0		0.5		12.6	0	
24 - 5395 - MAIN ST @ CONVERSE AVE		0		7	1		0		8.2	0.5		0		11.9	0.5		0		13.1	1.4	
25 - 5396 - MAIN ST @ PIERCE AVE		0		7.8	0.1		0		8.3	1.3		0.5		12.7	0.5		0.3		13.3	0.3	
26 - 5397 - MAIN ST @ FLOYD ST		0		8.6	0.2		0		8.5	1.3		0		14	0.3		0.3		13.3	0.5	
27 - 5398 - MAIN ST @ EVERETT ST		0		11.2	1.2		0		9.7	0		0		14	0		0		13.3	0.5	
28 - 5399 - MAIN ST @ PRESCOTT ST		0		13.3	1.5		0		11.2	0.3		0		14.3	1.3		0		14.6	0.6	
29 - 5400 - MAIN ST @ BALDWIN AVE		0.1		13.7	0.5		0.1		11.6	1.3		0		15.6	0.5		0		15.1	0.5	
30 - 5401 - 202 MAIN ST		0		13.9	0.4		0.1		11.9	0.5		0		16.1	2.3		0.5		16.9	0.3	
31 - 5402 - MAIN ST @ PARLIN ST		0		13.9	0.6		0.1		12.4	2		0.5		17.6	0.8		0		17.7	0.2	
32 - 5403 - MAIN ST @ TILESTON ST		0.5		13.9	0.1		0.1		12.4	1.5		0		19.1	0.5		0.8		17.4	0.3	
33 - 5404 - MAIN ST @ WEST ST		0.3		14.1	0.3		0.8		11.9	0.5		0.3		19.3	1.3		0		18.7	1.1	
34 - 5497 - BROADWAY @ BOWDOIN ST		0		15.3	0.3		0.1		12.1	0		0		19.3	0.8		0		19.5	1	
35 - 5498 - BROADWAY OPP BEACHAM ST		0.1		15.4	0.2		0.1		12.2	0.5		0		19.8	0		0		19.5	0.1	
36 - 5499 - BROADWAY OPP THORNDIKE ST		0		17	0.3		0		12.5	1.5		0.3		21	0.5		0		20	0.7	
37 - 5500 - BROADWAY @ HORIZON WAY		0		17.3	0.1		0		12.6	0.5		0		21.5	0		0		20	0	
38 - 5501 - OPP 173 ALFORD ST		0	0	17.3	0		0	1	11.6	0		0	1	20.5	0		0	2	18	0	
39 - 55011 - ALFORD ST @ MWRA PUMP STATION		0		17.3	0		0		11.6	0		0		20.5	0		0		18	0	
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN		0		17.3	0		0		11.6	0		0		20.5	0		0		18	0	
41 - 5502 - ALFORD ST @ WEST ST		0.3		17	0		0		11.6	0		0		20.5	0		0		18	0.1	
42 - 2874 - SULLIVAN STATION - UPPER BUSW		17.7		-0.7	0		12		-0.4	0		20.8		-0.3	0		18.5		-0.5	0	
Maximum				17.3					12.6					21.5					20		
Total		27.6			16.1		16.5			27.8		28.3			29.5		30.3			29.6	

Massachusetts Bay Transportation Authority
Route 105
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																				
	5.1) [10] !Fall 2012!			12:55 (105.1) [7] !Fall 2012!					14:00 (105.1) [5] !Fall 2012!					15:10 (105.1) [5] !Fall 2012!					15:45 (105.1) [11] !I		
Seq - StopID - Stop Name	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		13	6.6	2	0		8.6	9.4	4	0		13.4	8.2	1	0		9.2	12.5	2	0
2 - 5289 - CENTRE ST @ STOP & SHOP	0.2		15.5	2.3		0.4		10.5	1.2		0.2		14.4	2.4		0		11.6	1.3		0.1
3 - 5373 - 310 MAIN ST	0		16.8	2		0		12.5	0.4		0		14.8	2.4		0		14	1.9		0.2
4 - 5375 - EASTERN AVE @ FERRY ST	0.8		16.1	0.3		0.9		11.9	0		0.2		14.6	0.2		0.4		13.8	0		0.5
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0.5		15.9	0		0		11.9	0.8		1.2		14.2	0		0.6		13.2	0		0.3
6 - 5377 - EASTERN AVE @ FRANKLIN ST	1		14.9	0.1		0.1		11.9	0		0.4		13.8	0		0.4		12.8	0.3		2.1
7 - 5378 - 435 EASTERN AVE	0.1		15	0		0		11.9	0		0		13.8	0		0		12.8	0		0.1
8 - 45378 - LYME ST @ BRYANT ST	1.3		13.8	0.3		1.4		10.8	0		0.4		13.4	0		0.6		12.2	0.1		1.7
9 - 5379 - 210 LYME ST	0.3		13.9	0		0.3		10.5	0.4		0.2		13.6	0		1.2		11	0.2		0.1
10 - 5380 - WILLOW ST @ DANIELS ST	0.5		13.6	0.7		0.1		11.1	0		0.4		13.2	0.8		0.4		11.4	0		0.5
11 - 5381 - 23 BOWDOIN ST	0.5		13.4	0.3		0.7		10.7	0		0.6		12.6	0		1.4		10	0		0.7
12 - 5382 - 91 BOWDOIN ST	0.7		13.4	0.4		0		11.1	0.2		0.4		12.4	0		0		10	0.1		0.6
13 - 5383 - BOWDOIN ST @ NEWLAND ST	1.3		12.8	0.3		1		10.4	0.2		1.2		11.4	0.6		0.8		9.8	0.6		2
14 - 5384 - NEWLAND ST @ ALDEN ST	2		11.4	0.7		1.1		10	0.8		1.2		11	0.6		0.8		9.6	0.2		1.2
15 - 5385 - NEWLAND ST @ BRYANT ST	0.7		11.1	0.1		0.7		9.4	0.2		0.2		11	0		1		8.6	0.4		0.6
16 - 5386 - BRYANT ST @ HARVARD ST	1.2		10	0		0.1		9.3	0.6		0.8		10.8	0		0.6		8	1.1		0.9
17 - 5387 - BRYANT ST @ WILLOW ST	0.1		11.1	1		0.6		9.7	0.2		1		10	1		0		9	0.6		0.6
18 - 5388 - CROSS ST @ HENRY ST	0.2		11.1	0.1		0.1		9.7	0		0.2		9.8	0		0.6		8.4	0.6		0.9
19 - 5389 - CROSS ST @ FERRY ST	0.4		11.7	0.4		0.1		10	0		0.2		9.6	0.2		1.2		7.4	0.3		0
20 - 5391 - CROSS ST @ WALNUT ST	0.3		11.5	0		0		10	0		0		9.6	0		0		7.4	0.1		0.1
21 - 5392 - CROSS ST @ PELHAM ST	0.4		11.5	0.1		0.3		9.8	0		0.4		9.2	0		0		7.4	0.1		0.4
22 - 5393 - CROSS ST @ HIGH ST	0		11.5	0		0.4		9.4	0		0		9.2	0.8		0.6		7.6	0.1		0.1
23 - 5394 - CROSS ST @ MAIN ST	0.2		11.3	0		0.3		9.1	0.4		0.4		9.2	0		0.2		7.4	0		0.1
24 - 5395 - MAIN ST @ CONVERSE AVE	0.1		12.6	0.3		0.1		9.3	1.4		0.2		10.4	0		0.2		7.2	0.3		0
25 - 5396 - MAIN ST @ PIERCE AVE	0.2		12.7	1		0.1		10.2	1.6		0		12	0.2		0.2		7.2	0.3		0
26 - 5397 - MAIN ST @ FLOYD ST	0		13.2	0.7		0.3		10.6	2.4		0.2		14.2	0		0		7.2	0.5		0.2
27 - 5398 - MAIN ST @ EVERETT ST	0.3		13.4	0.3		0.1		10.8	0.2		0.2		14.2	0.4		0		7.6	0.1		0
28 - 5399 - MAIN ST @ PRESCOTT ST	0.2		13.8	0.9		0.3		11.4	1.4		0		15.6	0.2		0		7.8	0.8		0
29 - 5400 - MAIN ST @ BALDWIN AVE	0		14.3	0.7		0		12.1	0.8		0.2		16.2	0		0.2		7.6	0.5		0
30 - 5401 - 202 MAIN ST	0		14.6	0.3		0		12.4	1		0.4		16.8	0.2		0		7.8	0.4		0.4
31 - 5402 - MAIN ST @ PARLIN ST	0		14.8	0		0		12.4	0		0		16.8	0		0		7.8	0		0.1
32 - 5403 - MAIN ST @ TILESTON ST	0.2		14.9	0.1		0.4		12.1	0.2		0.2		16.8	0.4		0.2		8	0.3		1
33 - 5404 - MAIN ST @ WEST ST	0		16	0.3		0.4		12	2		0.2		18.6	0.4		0		8.4	0.5		0
34 - 5497 - BROADWAY @ BOWDOIN ST	1.1		15.9	0.6		0		12.6	0.4		0		19	0.2		0		8.6	0.8		0.1
35 - 5498 - BROADWAY OPP BEACHAM ST	0.4		15.6	0.9		0.1		13.4	0.4		0.4		19	1		0.2		9.4	0.4		0.4
36 - 5499 - BROADWAY OPP THORNDIKE ST	0.5		15.8	0.6		0.1		13.9	0		0		19	0		0.2		9.2	1.1		0
37 - 5500 - BROADWAY @ HORIZON WAY	0		15.8	0		0		13.9	0.2		0		19.2	0		0		9.2	0		0
38 - 5501 - OPP 173 ALFORD ST	0	2	13.8	0		0	2	11.9	0		0	4	15.2	0		0	1	8.2	0		0
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		13.8	0		0		11.9	0		0		15.2	0		0		8.2	0		0
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		13.8	0		0		11.9	0		0		15.2	0		0		8.2	0		0
41 - 5502 - ALFORD ST @ WEST ST	0		13.9	0		0.3		11.6	0		0		15.2	0		0		8.2	0		0
42 - 2874 - SULLIVAN STATION - UPPER BUSW	14.7		-0.8	0		11.9		-0.3	0		15.2		7.1E-15	0		8.6		-0.4	0		10.6
Maximum			16.8					13.9					19.2					14			
Total	30.4			22.4		23.1			26.8		26.8			20.2		20.6			26.3		26.5

Massachusetts Bay Transportation Authority
Route 105
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	all 2012!		16:20 (105.1) [1] !Fall 2012!					16:55 (105.1) [8] !Fall 2012!					17:30 (105.1) [6] !Fall 2012!					18:05 (105.1) [8] !Fall 2012!			
	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA		14.5	15	0	0		15	19.8	0	0		19.8	21	0	0		21	21.5	1	0	
2 - 5289 - CENTRE ST @ STOP & SHOP		15.7	4		0		19	2.5		0.8		21.5	2		0.3		22.7	2.1		0.1	
3 - 5373 - 310 MAIN ST		17.4	0		0		19	2		0.1		23.4	3		1		24.7	2.3		0.1	
4 - 5375 - EASTERN AVE @ FERRY ST		16.9	0		0		19	0.1		0.6		22.9	0.2		1.2		23.7	0		0.8	
5 - 5376 - EASTERN AVE @ PHILLIPS CT		16.6	0		2		17	0.3		0.9		22.3	0.2		1		22.9	0.3		1.3	
6 - 5377 - EASTERN AVE @ FRANKLIN ST		14.8	0		0		17	0.1		1.9		20.5	0.2		1		22.1	0		3.3	
7 - 5378 - 435 EASTERN AVE		14.7	0		1		16	0		0.4		20.1	0		0		22.1	0.1		0	
8 - 45378 - LYME ST @ BRYANT ST		13.1	0		0		16	0.3		2.4		18	0.2		0.8		21.5	0.1		2.5	
9 - 5379 - 210 LYME ST		13.2	0		0		16	0		1.5		16.5	0		0.5		21	0.1		1.6	
10 - 5380 - WILLOW ST @ DANIELS ST		12.7	0		4		12	0.1		1.8		14.8	0		1.7		19.3	0		0.9	
11 - 5381 - 23 BOWDOIN ST		12	0		1		11	0		0.1		14.7	0.5		1.5		18.3	0.3		1.6	
12 - 5382 - 91 BOWDOIN ST		11.5	0		0		11	0.3		1.5		13.5	0.3		0.5		18.1	0		0.1	
13 - 5383 - BOWDOIN ST @ NEWLAND ST		10.1	1		4		8	0		3.4		10.1	0.7		4.7		14.1	0.1		2.3	
14 - 5384 - NEWLAND ST @ ALDEN ST		9.1	0		0		8	0.4		0.9		9.6	1		1.5		13.6	0.5		1.5	
15 - 5385 - NEWLAND ST @ BRYANT ST		8.9	0		0		8	0.3		2		7.9	0		2.2		11.4	0		1.6	
16 - 5386 - BRYANT ST @ HARVARD ST		9.1	0		0		8	0.1		1.5		6.5	0.3		1.8		9.9	0		1.1	
17 - 5387 - BRYANT ST @ WILLOW ST		9.1	0		0		8	0.3		0.6		6.2	0.3		0.3		9.9	0.1		0.9	
18 - 5388 - CROSS ST @ HENRY ST		8.8	0		0		8	0.1		0.6		5.7	0.2		1.3		8.8	1.1		1.3	
19 - 5389 - CROSS ST @ FERRY ST		9.1	0		1		7	0.1		0.5		5.3	0.8		1.7		7.9	0.4		1.4	
20 - 5391 - CROSS ST @ WALNUT ST		9.1	0		0		7	0.1		0.3		5.1	0		0.7		7.2	0.4		0.6	
21 - 5392 - CROSS ST @ PELHAM ST		8.8	0		0		7	0.3		0.1		5.3	0		0.5		6.7	0		0	
22 - 5393 - CROSS ST @ HIGH ST		8.8	0		1		6	0.1		0.1		5.3	0		0.8		5.9	0		0.9	
23 - 5394 - CROSS ST @ MAIN ST		8.7	1		0		7	0		0.3		5	0		0		5.9	0		0.5	
24 - 5395 - MAIN ST @ CONVERSE AVE		9	2		1		8	0.3		0.4		4.9	0.2		0.3		5.8	0.1		0	
25 - 5396 - MAIN ST @ PIERCE AVE		9.3	0		0		8	0		0		4.9	0.3		0.3		5.8	0.1		0.3	
26 - 5397 - MAIN ST @ FLOYD ST		9.6	0		0		8	1.3		0.1		6.1	1.2		0.3		6.7	0		0	
27 - 5398 - MAIN ST @ EVERETT ST		9.7	1		0		9	0.5		0.5		6.1	0.2		0		6.9	0		0	
28 - 5399 - MAIN ST @ PRESCOTT ST		10.5	0		0		9	0.1		0		6.2	0.2		0.3		6.8	0.3		0.6	
29 - 5400 - MAIN ST @ BALDWIN AVE		11	1		0		10	0.3		0		6.5	0		0		6.8	0		0	
30 - 5401 - 202 MAIN ST		11	1		1		10	0.1		0		6.6	0		1		5.8	0		0	
31 - 5402 - MAIN ST @ PARLIN ST		10.9	0		0		10	0.6		0		7.2	0.5		0.7		5.6	0		0.3	
32 - 5403 - MAIN ST @ TILESTON ST		10.2	0		0		10	0.1		0.1		7.2	0.3		0.7		5.2	0.4		0.3	
33 - 5404 - MAIN ST @ WEST ST		10.7	1		0		11	0.3		0.1		7.4	0.2		0		5.4	0		0.8	
34 - 5497 - BROADWAY @ BOWDOIN ST		11.4	0		0		11	0.3		0.3		7.4	0		0.2		5.2	0.1		0.1	
35 - 5498 - BROADWAY OPP BEACHAM ST		11.4	0		0		11	0		0.9		6.5	0.5		0.2		5.5	0.8		0	
36 - 5499 - BROADWAY OPP THORNDIKE ST		12.5	2		0		13	0.5		0.8		6.2	0.5		0		6	0		0	
37 - 5500 - BROADWAY @ HORIZON WAY		12.5	0		0		13	0		0		6.2	0		0		6	0		0	
38 - 5501 - OPP 173 ALFORD ST	2	10.5	0		0	0	13	0		0	0	6.2	0		0	0	6	0.1		0	1
39 - 55011 - ALFORD ST @ [illegible] STATION		10.5	0		0		13	0		0		6.2	0		0		6	0		0	
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN		10.5	0		0		13	0		0		6.2	0		0		6	0		0	
41 - 5502 - ALFORD ST @ WEST ST		10.5	0		2		11	0		0		6.2	0		0		6	0		0.1	
42 - 2874 - SULLIVAN STATION - UPPER BUSW		-0.1	0		11		0	0		6.3		-0.1	0		5.7		0.3	0		5.1	
Maximum		17.4					19					23.4					24.7				
Total			29		29			31.4		31.5			34.8		34.7			31.3		31.8	

Massachusetts Bay Transportation Authority
Route 105
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

		18:40 (105.1) [4] !Fall 2012!					Total		
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	22.5	19.5	1	0		20.5	182	0	200
2 - 5289 - CENTRE ST @ STOP & SHOP	24.5	1.3		1		20.8	26.1	3.8	222.3
3 - 5373 - 310 MAIN ST	26.7	1.8		0.3		22.3	18.8	2.3	238.8
4 - 5375 - EASTERN AVE @ FERRY ST	25.9	0		1.8		20.5	3.3	9.4	232.7
5 - 5376 - EASTERN AVE @ PHILLIPS CT	24.9	0		1.8		18.7	2.2	9.9	225
6 - 5377 - EASTERN AVE @ FRANKLIN ST	21.6	0.8		1.3		18.2	2.9	20.8	207.1
7 - 5378 - 435 EASTERN AVE	21.7	0.5		0.3		18.4	0.8	3.3	204.6
8 - 45378 - LYME ST @ BRYANT ST	19.3	0		1.8		16.6	3.5	16.5	191.6
9 - 5379 - 210 LYME ST	17.8	0		0.3		16.3	3.4	6.3	188.7
10 - 5380 - WILLOW ST @ DANIELS ST	16.9	0		0.8		15.5	4.7	12.6	180.8
11 - 5381 - 23 BOWDOIN ST	15.6	0		1		14.5	3.6	9.8	174.6
12 - 5382 - 91 BOWDOIN ST	15.5	0		0		14.5	8.4	6.2	176.8
13 - 5383 - BOWDOIN ST @ NEWLAND ST	13.3	0.5		4.3		10.7	14.8	28.7	162.9
14 - 5384 - NEWLAND ST @ ALDEN ST	12.3	0		1.5		9.2	21.7	12.5	172.1
15 - 5385 - NEWLAND ST @ BRYANT ST	10.7	0		1		8.2	7.8	11.4	168.5
16 - 5386 - BRYANT ST @ HARVARD ST	9.6	0		0.5		7.7	4.8	8.7	164.6
17 - 5387 - BRYANT ST @ WILLOW ST	8.8	0		0		7.7	13.4	5.7	172.3
18 - 5388 - CROSS ST @ HENRY ST	8.6	0		2.3		5.4	6	8.1	170.2
19 - 5389 - CROSS ST @ FERRY ST	7.6	0		0.5		4.9	7.8	16.4	161.6
20 - 5391 - CROSS ST @ WALNUT ST	7.4	0.3		0		5.2	4.6	3	163.2
21 - 5392 - CROSS ST @ PELHAM ST	7.4	0.3		0.3		5.2	4.8	2.5	165.5
22 - 5393 - CROSS ST @ HIGH ST	6.5	0		0.3		4.9	2.6	4.2	163.9
23 - 5394 - CROSS ST @ MAIN ST	6	0.3		0		5.2	2.7	5	161.6
24 - 5395 - MAIN ST @ CONVERSE AVE	6.1	0		0		5.2	10.7	2.3	170
25 - 5396 - MAIN ST @ PIERCE AVE	5.9	0.3		0.5		5	10.9	2.4	178.5
26 - 5397 - MAIN ST @ FLOYD ST	5.9	0		0		5	13.1	1.4	190.2
27 - 5398 - MAIN ST @ EVERETT ST	5.9	0.3		0.3		5	13.4	1.4	202.2
28 - 5399 - MAIN ST @ PRESCOTT ST	5.6	0		0		5	12.9	1.4	213.7
29 - 5400 - MAIN ST @ BALDWIN AVE	5.6	0		1.3		3.7	11.3	1.9	223.1
30 - 5401 - 202 MAIN ST	5.6	0.3		0.3		3.7	8.2	3.7	227.6
31 - 5402 - MAIN ST @ PARLIN ST	5.3	0		0		3.7	6.6	1.7	232.5
32 - 5403 - MAIN ST @ TILESTON ST	5.4	0		0		3.7	5.3	4.5	233.3
33 - 5404 - MAIN ST @ WEST ST	4.6	0.3		0.3		3.7	12.8	4.9	241.2
34 - 5497 - BROADWAY @ BOWDOIN ST	4.6	0.5		0		4.2	9.7	2.2	248.7
35 - 5498 - BROADWAY OPP BEACHAM ST	5.4	0		0.3		3.9	8.4	3.1	254
36 - 5499 - BROADWAY OPP THORNDIKE ST	5.4	0		0		3.9	13.4	1.9	265.5
37 - 5500 - BROADWAY @ HORIZON WAY	5.4	0		0		3.9	2.4	0	267.9
38 - 5501 - OPP 173 ALFORD ST	4.5	0		0	1	2.9	0.1	0	250
39 - 55011 - ALFORD ST @ [illegible] STATION	4.5	0		0		2.9	0	0	250
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	4.5	0		0		2.9	0	0	250
41 - 5502 - ALFORD ST @ WEST ST	4.4	0		0		2.9	0.1	3.8	246.3
42 - 2874 - SULLIVAN STATION - UPPER BUSW	-0.7	0		3.3		-0.4	0	250.3	-4
Maximum	26.7					22.3	0	0	360.9
Total		26.5		26.5			486.9	491.9	0

Massachusetts Bay Transportation Authority
Route 105
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	05:30 (105.1) [3] !Fall 2012!					06:30 (105.1) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	2		0		2	3.5		0		3.5
2 - 5504 - ALFORD ST @ MAIN ST	0		0		2	0		0		3.5
3 - 5505 - 173 ALFORD ST	0	0	0		2	0	1	0		4.5
4 - 5506 - BROADWAY @ DEXTER ST	0		0		2	0		0.5		4
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		2	0.1		0.4		3.7
6 - 5508 - BROADWAY @ LANGDON ST	0		0		2	0.2		1.5		2.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	1.3		0		3.3	0		0		2.4
8 - 5405 - MAIN ST @ ELMWOOD ST	0		1		2.3	0.2		0.1		2.5
9 - 5406 - MAIN ST @ OAKES ST	0		0		2.3	0.1		0		2.6
10 - 45406 - MAIN ST @ WINTHROP ST	0		0		2.3	0		0.1		2.5
11 - 5407 - MAIN ST @ FOREST AVE	0		0		2.3	0		0		2.5
12 - 5408 - MAIN ST @ BALDWIN AVE	0		0		2.3	0.2		0.1		2.6
13 - 5409 - MAIN ST @ CLARK ST	0		0		2.3	0		0		2.6
14 - 5410 - MAIN ST @ DYER AVE	0		0		2.3	0.1		0.6		2.1
15 - 5411 - MAIN ST @ BRADFORD ST	0		0		2.3	0.2		0.3		2
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		0.3		2	0		0		2
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		2	0.1		0		2.1
18 - 5414 - CROSS ST @ MAIN ST	0		0		2	0.1		0.2		2
19 - 5415 - CROSS ST @ STEVENS ST	1.3		0		3.3	0		0		2
20 - 5416 - CROSS ST @ PRATT ST	0		0		3.3	0.2		0		2.2
21 - 5417 - CROSS ST @ WALNUT ST	0.3		0		3.6	0.2		0		2.4
22 - 5418 - CROSS ST @ FERRY ST	2.3		0		5.9	0.3		0.1		2.6
23 - 5419 - CROSS ST @ HENRY ST	1.7		0		7.6	1.1		0		3.7
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	0		0		7.6	1.3		0		5
25 - 5421 - BRYANT ST @ HARVARD ST	0.7		0		8.3	1.2		0		6.2
26 - 5422 - NEWLAND ST @ BRYANT ST	1		0		9.3	3.6		0		9.8
27 - 5423 - 218 NEWLAND ST	1.7		0		11	1.6		0		11.4
28 - 5424 - 172 BOWDOIN ST	3		0		14	8.7		0.1		20
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0.3		0		14.3	3.2		0		23.2
30 - 5426 - BOWDOIN ST @ WILLOW ST	1.7		0		16	1.8		0		25
31 - 5427 - WILLOW ST @ LYME ST	0		0		16	0.1		0		25.1
32 - 5428 - LYME ST @ CROSS ST	0		0		16	0.9		0		26
33 - 45428 - LYME ST @ BRYANT ST	5		0		21	5.1		0		31.1
34 - 5429 - 420 EASTERN AVE	0		0		21	0.4		0		31.5
35 - 5430 - EASTERN AVE @ FRANKLIN ST	2.3		0		23.3	1.6		0		33.1
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0.3		0		23.6	0.2		0.1		33.2
37 - 5365 - EASTERN AVE @ MAIN ST	0		0		23.6	0.1		0		33.3
38 - 5366 - MAIN ST @ CENTRE ST	0.7		0.3		24	0.1		0		33.4
39 - 5342 - MAIN ST OPP PLEASANT ST	0.3		0		24.3	0.4		6		27.8
40 - 9215 - MAIN ST @ SALEM ST	0.7		0		25	0.1		0		27.9
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0.7		0		25.7	0.7		0		28.6
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		25.7	0		0		28.6
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		25.7	0	0	0		27.6	1	0.1
Maximum					25.7					33.4
Total	27.3		27.3			37.7		37.7		

Seq - StopID - Stop Name	07:10 (105.1) [4] !Fall 2012!					07:50 (105.1) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	1.3		0		1.3	1.7		0		1.7
2 - 5504 - ALFORD ST @ MAIN ST	0		0		1.3	0		0		1.7
3 - 5505 - 173 ALFORD ST	0	1	0		2.3	0	0	0		1.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0		2.3	0		0		1.7
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		2.3	0		0.3		1.4
6 - 5508 - BROADWAY @ LANGDON ST	1.8		0.3		3.8	0.3		0.3		1.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		3.8	0		0		1.4
8 - 5405 - MAIN ST @ ELMWOOD ST	0		0		3.8	0.7		0		2.1
9 - 5406 - MAIN ST @ OAKES ST	0		0		3.8	1		0		3.1
10 - 45406 - MAIN ST @ WINTHROP ST	0		0		3.8	0.3		0		3.4
11 - 5407 - MAIN ST @ FOREST AVE	0		0		3.8	0.3		0		3.7
12 - 5408 - MAIN ST @ BALDWIN AVE	0		0		3.8	0.3		0		4
13 - 5409 - MAIN ST @ CLARK ST	1		0.8		4	0		0		4
14 - 5410 - MAIN ST @ DYER AVE	0.5		0.3		4.2	1.3		0.3		5
15 - 5411 - MAIN ST @ BRADFORD ST	2		1		5.2	0.3		1		4.3
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		0.3		4.9	0.3		0		4.6
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		4.9	1.3		0.3		5.6
18 - 5414 - CROSS ST @ MAIN ST	0		0		4.9	0.7		0.3		6
19 - 5415 - CROSS ST @ STEVENS ST	0.3		0.3		4.9	0.3		0		6.3
20 - 5416 - CROSS ST @ PRATT ST	0.3		0		5.2	0		0		6.3
21 - 5417 - CROSS ST @ WALNUT ST	0		0.8		4.4	0.3		0.3		6.3
22 - 5418 - CROSS ST @ FERRY ST	2.3		1		5.7	0.7		0.7		6.3
23 - 5419 - CROSS ST @ HENRY ST	2		0		7.7	1		0.3		7
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	1		1.3		7.4	4.3		0		11.3
25 - 5421 - BRYANT ST @ HARVARD ST	2.5		0		9.9	3.3		0		14.6
26 - 5422 - NEWLAND ST @ BRYANT ST	1.8		0		11.7	2.7		0.7		16.6
27 - 5423 - 218 NEWLAND ST	8.3		0		20	5.3		0		21.9
28 - 5424 - 172 BOWDOIN ST	4		0.3		23.7	3.3		0		25.2
29 - 5425 - BOWDOIN ST OPP HARVARD ST	8.8		0.5		32	3.3		0		28.5
30 - 5426 - BOWDOIN ST @ WILLOW ST	1.5		0		33.5	2.7		0.3		30.9
31 - 5427 - WILLOW ST @ LYME ST	1		0		34.5	0.3		0		31.2
32 - 5428 - LYME ST @ CROSS ST	0.5		0		35	1.7		0		32.9
33 - 45428 - LYME ST @ BRYANT ST	3.8		0		38.8	2.7		0		35.6
34 - 5429 - 420 EASTERN AVE	0		0		38.8	0		0		35.6
35 - 5430 - EASTERN AVE @ FRANKLIN ST	3.5		0		42.3	1		0		36.6
36 - 5431 - EASTERN AVE @ PHILLIPS CT	1		2.3		41	0		0		36.6
37 - 5365 - EASTERN AVE @ MAIN ST	0.3		0		41.3	1.3		0.7		37.2
38 - 5366 - MAIN ST @ CENTRE ST	0.5		1.5		40.3	0		0		37.2
39 - 5342 - MAIN ST OPP PLEASANT ST	0.8		2.3		38.8	0		2.7		34.5
40 - 9215 - MAIN ST @ SALEM ST	0		0.3		38.5	0.7		0.3		34.9
41 - 19215 - FLORENCE ST @ RAMSDELL RD	2.5		1		40	1.3		0		36.2
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		40	0		0.3		35.9
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		39	1	0	0		34.7	0	1.3
Maximum					42.3					37.2
Total	52.8		52.8			45		43.7		

Massachusetts Bay Transportation Authority
Route 105
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	08:55 (105.1) [10] !Fall 2012!					10:05 (105.1) [4] !Fall 2012!					11:15 (105.1) [10] !Fall 2012!					12:25 (105.1) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	3.3		0		3.3	8		0		8	6.5		0		6.5	7.9		0		7.9
2 - 5504 - ALFORD ST @ MAIN ST	0		0		3.3	0		0		8	0.1		0		6.6	0		0		7.9
3 - 5505 - 173 ALFORD ST	0	1	0		4.3	0	6	0		14	0	2	0		8.6	0	3	0		10.9
4 - 5506 - BROADWAY @ DEXTER ST	0		0		4.3	0		0		14	0		0		8.6	0		0		10.9
5 - 5507 - BROADWAY @ THORNDIKE ST	0.6		0.1		4.8	0		0		14	0.3		0.1		8.8	0		0.1		10.8
6 - 5508 - BROADWAY @ LANGDON ST	0.1		0.1		4.8	0		0.5		13.5	0.2		0.5		8.5	0.1		0		10.9
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		4.8	0		0.3		13.2	0		0		8.5	0		0		10.9
8 - 5405 - MAIN ST @ ELMWOOD ST	0.3		0		5.1	0.3		0.5		13	0.2		0		8.7	0.8		0.1		11.6
9 - 5406 - MAIN ST @ OAKES ST	0.1		0		5.2	0.3		0		13.3	0.5		0.5		8.7	0.1		0.2		11.5
10 - 45406 - MAIN ST @ WINTHROP ST	0		0		5.2	1.3		0.5		14.1	0.2		0.1		8.8	0.2		0.6		11.1
11 - 5407 - MAIN ST @ FOREST AVE	0.3		0		5.5	0.3		0		14.4	0.3		0		9.1	0		0.4		10.7
12 - 5408 - MAIN ST @ BALDWIN AVE	0.1		0.1		5.5	0		0		14.4	0		0		9.1	0		0.1		10.6
13 - 5409 - MAIN ST @ CLARK ST	0		0		5.5	0		0		14.4	0.8		0.1		9.8	0		0		10.6
14 - 5410 - MAIN ST @ DYER AVE	0.5		0.1		5.9	0.3		0		14.7	0.4		0.5		9.7	0.1		0.4		10.3
15 - 5411 - MAIN ST @ BRADFORD ST	0.2		0.1		6	1		0.5		15.2	0.5		0.2		10	0.4		0.9		9.8
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0.1		0.2		5.9	0		0		15.2	0.9		0.5		10.4	0.2		0.1		9.9
17 - 5413 - MAIN ST @ CLARENDON ST	0.3		0.2		6	0		0.3		14.9	0.4		0.1		10.7	0.2		0		10.1
18 - 5414 - CROSS ST @ MAIN ST	0.2		0.4		5.8	0		0.8		14.1	1.2		0.4		11.5	0.1		0		10.2
19 - 5415 - CROSS ST @ STEVENS ST	0.2		0.1		5.9	0		0.3		13.8	0		0		11.5	0		0.2		10
20 - 5416 - CROSS ST @ PRATT ST	0.1		0.2		5.8	1.3		0		15.1	0		0		11.5	0		0.1		9.9
21 - 5417 - CROSS ST @ WALNUT ST	0		0		5.8	0		0		15.1	0.3		0.1		11.7	0		0.1		9.8
22 - 5418 - CROSS ST @ FERRY ST	1		0.3		6.5	0.5		0		15.6	0.9		0		12.6	1.1		0.2		10.7
23 - 5419 - CROSS ST @ HENRY ST	1.4		0.4		7.5	1.3		0		16.9	0.2		0.1		12.7	0.4		0.1		11
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	1.6		0.3		8.8	3.3		0.3		19.9	0.8		0.9		12.6	1		1.1		10.9
25 - 5421 - BRYANT ST @ HARVARD ST	1.1		0		9.9	0.3		0.3		19.9	0.4		0		13	0.2		0.6		10.5
26 - 5422 - NEWLAND ST @ BRYANT ST	0.6		0		10.5	0.8		0.3		20.4	0.6		0.9		12.7	1		0.3		11.2
27 - 5423 - 218 NEWLAND ST	3.8		0.3		14	4.5		0		24.9	2.4		0.6		14.5	2		0.5		12.7
28 - 5424 - 172 BOWDOIN ST	2.1		0.3		15.8	2.3		0.8		26.4	1.4		0		15.9	2.1		0.4		14.4
29 - 5425 - BOWDOIN ST OPP HARVARD ST	1.1		0.3		16.6	2.5		0.8		28.1	1.2		0.5		16.6	0.4		0.5		14.3
30 - 5426 - BOWDOIN ST @ WILLOW ST	1.9		0		18.5	0		0		28.1	1.7		0.5		17.8	1.2		0.3		15.2
31 - 5427 - WILLOW ST @ LYME ST	0.4		0		18.9	0		0		28.1	0.1		0		17.9	0.2		0		15.4
32 - 5428 - LYME ST @ CROSS ST	0.4		0.1		19.2	0		0		28.1	0.4		0		18.3	0.2		0		15.6
33 - 45428 - LYME ST @ BRYANT ST	2.7		0.1		21.8	1.5		0		29.6	0.7		0		19	1.1		0		16.7
34 - 5429 - 420 EASTERN AVE	0		0		21.8	0		0		29.6	0		0.2		18.8	0		0		16.7
35 - 5430 - EASTERN AVE @ FRANKLIN ST	1.8		0.1		23.5	1.3		1.3		29.6	0.1		0		18.9	1.2		0		17.9
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0.1		0		23.6	0.5		0		30.1	0.2		0.1		19	0		0.2		17.7
37 - 5365 - EASTERN AVE @ MAIN ST	0.5		0.2		23.9	0		0.5		29.6	0.1		0.1		19	0		0.2		17.5
38 - 5366 - MAIN ST @ CENTRE ST	0.2		1		23.1	0.3		2		27.9	0		1.7		17.3	0.2		0.5		17.2
39 - 5342 - MAIN ST OPP PLEASANT ST	0		0.8		22.3	0		0.5		27.4	0.4		2.9		14.8	0		1.5		15.7
40 - 9215 - MAIN ST @ SALEM ST	0.1		0		22.4	0.3		0.5		27.2	0		0.1		14.7	0		0.1		15.6
41 - 19215 - FLORENCE ST @ RAMSDELL RD	1.9		0.4		23.9	0.5		1.3		26.4	0.4		0.1		15	0.3		0.3		15.6
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.2		23.7	0		0.5		25.9	0.1		0.5		14.6	0		0.3		15.3
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		21.2	1	1.5	0		19	6	0.8	0		11.8	2	0.8	0		12.3	3	0
Maximum					23.9					30.1					19					17.9
Total	29.1		27.6			32		31.3			24.9		24.1			22.7		22.7		

Massachusetts Bay Transportation Authority
Route 105
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																			
	13:30 (105.1) [7] !Fall 2012!					14:35 (105.1) [5] !Fall 2012!					15:10 (105.1) [11] !Fall 2012!					15:45 (105.1) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	8.1		0		8.1	9.4		0		9.4	12		0		12	20		0		20
2 - 5504 - ALFORD ST @ MAIN ST	0		0		8.1	0.4		0		9.8	0		0		12	0		0		20
3 - 5505 - 173 ALFORD ST	0	2	0		10.1	0	2	0		11.8	0	2	0		14	0	1	0		21
4 - 5506 - BROADWAY @ DEXTER ST	0		0		10.1	0		0.2		11.6	0		0.3		13.7	0		0		21
5 - 5507 - BROADWAY @ THORNDIKE ST	0.3		0.4		10	0		1		10.6	0		0.3		13.4	0		0		21
6 - 5508 - BROADWAY @ LANGDON ST	0.3		0.3		10	0		0.2		10.4	0.2		0.5		13.1	2		0		23
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0		10.1	0		0.6		9.8	0.4		0.7		12.8	0		0		23
8 - 5405 - MAIN ST @ ELMWOOD ST	0.3		0.6		9.8	0		0.2		9.6	0.5		0.5		12.8	0		1		22
9 - 5406 - MAIN ST @ OAKES ST	0.4		0.1		10.1	0		0		9.6	0.5		0.5		12.8	0		1		21
10 - 45406 - MAIN ST @ WINTHROP ST	0.1		0.1		10.1	0		1		8.6	0		0.2		12.6	0		0		21
11 - 5407 - MAIN ST @ FOREST AVE	0.6		0.1		10.6	0		0		8.6	0.1		0.3		12.4	0		0		21
12 - 5408 - MAIN ST @ BALDWIN AVE	0.3		0		10.9	0		0.2		8.4	0.3		1.4		11.3	0		1		20
13 - 5409 - MAIN ST @ CLARK ST	0.3		0.1		11.1	0.6		0.2		8.8	0.2		0.5		11	0		7		13
14 - 5410 - MAIN ST @ DYER AVE	0.6		0.1		11.6	0		0		8.8	0.6		0.3		11.3	2		0		15
15 - 5411 - MAIN ST @ BRADFORD ST	0.4		0.9		11.1	0		0.2		8.6	0.3		0.8		10.8	0		2		13
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0.1		0.6		10.6	0.4		0.2		8.8	0.5		0.8		10.5	0		0		13
17 - 5413 - MAIN ST @ CLARENDON ST	0.3		0.3		10.6	0.4		0.2		9	0.2		0		10.7	0		0		13
18 - 5414 - CROSS ST @ MAIN ST	0.1		0.4		10.3	0		0		9	0		0.2		10.5	0		0		13
19 - 5415 - CROSS ST @ STEVENS ST	0		0		10.3	0		0.2		8.8	0		0.5		10	0		1		12
20 - 5416 - CROSS ST @ PRATT ST	0		0		10.3	0		0		8.8	0		0.2		9.8	0		0		12
21 - 5417 - CROSS ST @ WALNUT ST	0.3		0.1		10.5	0.2		0		9	0		0.4		9.4	0		0		12
22 - 5418 - CROSS ST @ FERRY ST	0.1		0		10.6	0		0		9	0.3		0.1		9.6	0		1		11
23 - 5419 - CROSS ST @ HENRY ST	0.1		0.6		10.1	0.4		0		9.4	0.5		0.6		9.5	3		1		13
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	2		0.7		11.4	0.2		0.2		9.4	0.2		0.3		9.4	0		0		13
25 - 5421 - BRYANT ST @ HARVARD ST	0.6		0		12	0		0.2		9.2	0.2		0.3		9.3	1		1		13
26 - 5422 - NEWLAND ST @ BRYANT ST	0.7		0.1		12.6	0.8		0.6		9.4	0.3		0.5		9.1	1		0		14
27 - 5423 - 218 NEWLAND ST	1.3		1		12.9	0.6		1		9	0.5		0.5		9.1	0		0		14
28 - 5424 - 172 BOWDOIN ST	1.1		0.3		13.7	0		0		9	0.4		0.5		9	0		0		14
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0.3		0.3		13.7	2		0.4		10.6	0.2		0.3		8.9	1		0		15
30 - 5426 - BOWDOIN ST @ WILLOW ST	1.1		0.4		14.4	1.2		0		11.8	0.3		0.4		8.8	3		0		18
31 - 5427 - WILLOW ST @ LYME ST	0.3		0		14.7	0.2		0		12	0.2		0		9	0		0		18
32 - 5428 - LYME ST @ CROSS ST	0.3		0.1		14.9	0.2		0		12.2	0.2		0		9.2	2		0		20
33 - 45428 - LYME ST @ BRYANT ST	1		0.3		15.6	0.8		0		13	0		0.2		9	1		0		21
34 - 5429 - 420 EASTERN AVE	0.1		0.3		15.4	0		0		13	2.2		0.2		11	0		0		21
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0.3		0		15.7	0.8		0.6		13.2	2.5		0.2		13.3	0		0		21
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0.3		0		16	0		0.4		12.8	0.2		0.1		13.4	1		0		22
37 - 5365 - EASTERN AVE @ MAIN ST	0		0.4		15.6	0		0.8		12	0		0.3		13.1	0		2		20
38 - 5366 - MAIN ST @ CENTRE ST	0.1		0.6		15.1	0		0.6		11.4	0		0.8		12.3	0		0		20
39 - 5342 - MAIN ST OPP PLEASANT ST	0.3		1.7		13.7	0		0.8		10.6	0.1		1		11.4	0		3		17
40 - 9215 - MAIN ST @ SALEM ST	0.4		0.1		14	0		0.2		10.4	0		0.7		10.7	0		2		15
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		14	0.4		0		10.8	0.3		0.5		10.5	0		1		14
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.1		13.9	0		0		10.8	0		0.4		10.1	0		0		14
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		11.7	2	0.1	0		8.4	2	0.4	0		8	2	0.3	0		13	1	0
Maximum					16					13.2					14					23
Total	23.3		23.1			19		18.6			23.9		23.6			37		37		

Massachusetts Bay Transportation Authority
Route 105
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	16:20 (105.1) [10] !Fall 2012!					16:55 (105.1) [1] !Fall 2012!					17:30 (105.1) [8] !Fall 2012!					18:05 (105.1) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	11.4		0		11.4	21		0		21	12.6		0		12.6	12.8		0		12.8
2 - 5504 - ALFORD ST @ MAIN ST	1		0		12.4	0		0		21	0.6		0		13.2	0.5		0		13.3
3 - 5505 - 173 ALFORD ST	0	2	0		14.4	0	2	0		23	0	0	0		13.2	0	1	0		14.3
4 - 5506 - BROADWAY @ DEXTER ST	0		0.1		14.3	0		1		22	0		0		13.2	0		0		14.3
5 - 5507 - BROADWAY @ THORNDIKE ST	0.1		0.6		13.8	1		1		22	0		0.4		12.8	0.2		0.7		13.8
6 - 5508 - BROADWAY @ LANGDON ST	0.5		0.4		13.9	0		0		22	0		0		12.8	0		0.2		13.6
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.2		0.3		13.8	0		1		21	0		0.5		12.3	0.2		0.5		13.3
8 - 5405 - MAIN ST @ ELMWOOD ST	0		0.4		13.4	0		4		17	0		0.4		11.9	0		0.5		12.8
9 - 5406 - MAIN ST @ OAKES ST	0.1		0.2		13.3	0		0		17	0.1		0.1		11.9	0.7		0.2		13.3
10 - 45406 - MAIN ST @ WINTHROP ST	0.2		0.7		12.8	0		0		17	0.3		0.4		11.8	0		0.3		13
11 - 5407 - MAIN ST @ FOREST AVE	0		0		12.8	0		0		17	0.1		0.4		11.5	0		0.5		12.5
12 - 5408 - MAIN ST @ BALDWIN AVE	0.8		0.4		13.2	0		0		17	0.4		0		11.9	0		0.2		12.3
13 - 5409 - MAIN ST @ CLARK ST	0		0.3		12.9	0		0		17	0		0.3		11.6	0.2		1		11.5
14 - 5410 - MAIN ST @ DYER AVE	0.1		0.6		12.4	0		0		17	0.1		0.3		11.4	0.5		0.7		11.3
15 - 5411 - MAIN ST @ BRADFORD ST	0		0.9		11.5	0		1		16	0		1.6		9.8	0.2		0.5		11
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		0.4		11.1	0		1		15	0.1		0.6		9.3	0		1		10
17 - 5413 - MAIN ST @ CLARENDON ST	0		0.4		10.7	0		0		15	0.1		0		9.4	0		0.3		9.7
18 - 5414 - CROSS ST @ MAIN ST	0		1.4		9.3	0		0		15	0.4		0.3		9.5	0		0.5		9.2
19 - 5415 - CROSS ST @ STEVENS ST	0		0		9.3	0		1		14	0		1.3		8.2	0		1		8.2
20 - 5416 - CROSS ST @ PRATT ST	0		0.3		9	0		0		14	0		0.5		7.7	0		0.2		8
21 - 5417 - CROSS ST @ WALNUT ST	0		0.1		8.9	0		0		14	0.1		0.3		7.5	0		0.3		7.7
22 - 5418 - CROSS ST @ FERRY ST	0.3		0.8		8.4	0		1		13	0.4		0.4		7.5	0		1.2		6.5
23 - 5419 - CROSS ST @ HENRY ST	0.2		1		7.6	2		0		15	0.4		0.9		7	0.5		1.2		5.8
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	0.4		1.6		6.4	1		1		15	0.5		0.4		7.1	0.2		0.7		5.3
25 - 5421 - BRYANT ST @ HARVARD ST	0		0.2		6.2	0		0		15	0.4		1.6		5.9	0		0.3		5
26 - 5422 - NEWLAND ST @ BRYANT ST	0		0		6.2	0		0		15	0		0.1		5.8	0		0.5		4.5
27 - 5423 - 218 NEWLAND ST	0.6		0.1		6.7	0		1		14	0.5		0.6		5.7	0.8		1.3		4
28 - 5424 - 172 BOWDOIN ST	0.3		0.2		6.8	0		6		8	0.3		0.6		5.4	0		0.5		3.5
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0		0.2		6.6	0		0		8	0.1		0.6		4.9	0.3		0.2		3.6
30 - 5426 - BOWDOIN ST @ WILLOW ST	1.2		0.2		7.6	0		1		7	0.3		0.3		4.9	0.2		0.7		3.1
31 - 5427 - WILLOW ST @ LYME ST	0		0		7.6	0		0		7	0		0		4.9	0		0		3.1
32 - 5428 - LYME ST @ CROSS ST	0.4		0		8	0		0		7	0.1		0		5	0		0		3.1
33 - 45428 - LYME ST @ BRYANT ST	0.1		0.2		7.9	0		0		7	0.6		0.4		5.2	0		0		3.1
34 - 5429 - 420 EASTERN AVE	0.2		0		8.1	0		0		7	0.6		0.1		5.7	0		0.2		2.9
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		0		8.1	0		0		7	0.3		0.3		5.7	0.3		0		3.2
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0		0		8.1	0		0		7	0		0.1		5.6	0		0		3.2
37 - 5365 - EASTERN AVE @ MAIN ST	0.1		0.2		8	0		0		7	0.1		0.3		5.4	0		0		3.2
38 - 5366 - MAIN ST @ CENTRE ST	0		0.9		7.1	0		0		7	0.1		0		5.5	0		0		3.2
39 - 5342 - MAIN ST OPP PLEASANT ST	0		0.1		7	0		0		7	0		0.6		4.9	0		0		3.2
40 - 9215 - MAIN ST @ SALEM ST	0		0.3		6.7	0		1		6	0.4		0.1		5.2	0		0.2		3
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0.1		0.1		6.7	0		0		6	0.1		0		5.3	0.3		0		3.3
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0.1		6.6	0		0		6	0		0.1		5.2	0		0		3.3
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		4.6	2	0.1	0		4	2	0	0		5	0	0.5	0		2.7	1	0.2
Maximum					14.4					23					13.2					14.3
Total	18.3		18.3			25		25			20.1		19.6			17.8		18		

Massachusetts Bay Transportation Authority
Route 105
Weekday - Outbound
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(Urban Transportation Associates)

	18:40 (105.1) [3] !Fall 2012!					19:15 (105.1) [4] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	7.3		0		7.3	16		0		16	164.8	0	164.8
2 - 5504 - ALFORD ST @ MAIN ST	0		0.3		7	0		0		16	2.6	0.3	167.1
3 - 5505 - 173 ALFORD ST	0	0	0		7	0	3	0		19	0	0	196.1
4 - 5506 - BROADWAY @ DEXTER ST	0		0		7	0		0		19	0	2.1	194
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		7	0.8		0.3		19.5	3.4	5.7	191.7
6 - 5508 - BROADWAY @ LANGDON ST	0.7		0		7.7	0		0		19.5	6.4	4.8	193.3
7 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.3		7.7	0		0		19.5	2.5	4.2	191.6
8 - 5405 - MAIN ST @ ELMWOOD ST	0		0.7		7	0.5		1.5		18.5	3.8	11.5	183.9
9 - 5406 - MAIN ST @ OAKES ST	0		0.3		6.7	0.8		0		19.3	4.7	3.1	185.5
10 - 45406 - MAIN ST @ WINTHROP ST	0		2.7		4	0		0		19.3	2.6	6.7	181.4
11 - 5407 - MAIN ST @ FOREST AVE	0		0		4	0		0.3		19	2	2	181.4
12 - 5408 - MAIN ST @ BALDWIN AVE	0		0		4	0		0.5		18.5	2.4	4	179.8
13 - 5409 - MAIN ST @ CLARK ST	0.3		0.7		3.6	0		0.3		18.2	3.4	11.3	171.9
14 - 5410 - MAIN ST @ DYER AVE	0		0		3.6	0.3		0.3		18.2	7.4	4.5	174.8
15 - 5411 - MAIN ST @ BRADFORD ST	0		0.3		3.3	0		0.5		17.7	5.5	12.7	167.6
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		1.3		2	0		0.3		17.4	2.6	7.6	162.6
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		2	0.3		0.3		17.4	3.6	2.4	163.8
18 - 5414 - CROSS ST @ MAIN ST	0		1		1	0		0.3		17.1	2.8	6.2	160.4
19 - 5415 - CROSS ST @ STEVENS ST	0		0.3		0.7	0		0.8		16.3	2.1	7	155.5
20 - 5416 - CROSS ST @ PRATT ST	0		0		0.7	0		0		16.3	1.9	1.5	155.9
21 - 5417 - CROSS ST @ WALNUT ST	0		0.3		0.4	0		0.5		15.8	1.7	3.3	154.3
22 - 5418 - CROSS ST @ FERRY ST	0		0.3		0.1	0.3		0.5		15.6	10.5	7.6	157.2
23 - 5419 - CROSS ST @ HENRY ST	0		0.3		-0.2	0		1.8		13.8	16.2	8.3	165.1
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	1.3		0.3		0.8	0		1.3		12.5	19.1	10.4	173.8
25 - 5421 - BRYANT ST @ HARVARD ST	0		0.3		0.5	0		0.8		11.7	11.9	5.6	180.1
26 - 5422 - NEWLAND ST @ BRYANT ST	0		0.3		0.2	0		0.3		11.4	14.9	4.6	190.4
27 - 5423 - 218 NEWLAND ST	0		0.7		-0.5	0		3		8.4	33.9	10.6	213.7
28 - 5424 - 172 BOWDOIN ST	0		0.7		-1.2	1		0.8		8.6	30	11.5	232.2
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0.3		0.7		-1.6	0.3		2.5		6.4	25.3	7.8	249.7
30 - 5426 - BOWDOIN ST @ WILLOW ST	0		0.7		-2.3	0		0		6.4	19.8	4.8	264.7
31 - 5427 - WILLOW ST @ LYME ST	0		0		-2.3	0		0		6.4	2.8	0	267.5
32 - 5428 - LYME ST @ CROSS ST	0		0		-2.3	0		0		6.4	7.3	0.2	274.6
33 - 45428 - LYME ST @ BRYANT ST	0		0		-2.3	0		0.5		5.9	26.1	1.7	299
34 - 5429 - 420 EASTERN AVE	0		0		-2.3	0		0		5.9	3.5	1	301.5
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		0		-2.3	0		0		5.9	17	2.5	316
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0		0		-2.3	0		0.5		5.4	3.8	3.8	316
37 - 5365 - EASTERN AVE @ MAIN ST	0		0		-2.3	0		0.5		4.9	2.5	6.2	312.3
38 - 5366 - MAIN ST @ CENTRE ST	0		0.3		-2.6	0		0		4.9	2.2	10.2	304.3
39 - 5342 - MAIN ST OPP PLEASANT ST	0		0.3		-2.9	0		0		4.9	2.3	24.2	282.4
40 - 9215 - MAIN ST @ SALEM ST	0.3		0		-2.6	0		0		4.9	3	5.9	279.5
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		-2.6	0		0.5		4.4	9.5	5.2	283.8
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		-2.6	0		0		4.4	0.1	2.5	281.4
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		1.3	0	0	0		1.8	3	0	0	251.8	6.1
Maximum					7.7					19.5	0	0	387.8
Total	10.7		14.7			20		20			486.6	485.1	0

Massachusetts Bay Transportation Authority
Route 105
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	06:15 (105.1) [4] !Fall 2012!					07:15 (105.1) [4] !Fall 2012!					08:15 (105.1) [4] !Fall 2012!					09:15 (105.1) [4] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	1.5	0	0		1.5	5.8	1	0		6.8	5.3	1	0		6.3	6.5	2	0		8.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0		1.5	0.2		0.2		6.8	0.3		0.2		6.4	0.2		0.2		8.5
3 - 5373 - 310 MAIN ST	0		0		1.5	0.3		0		7.1	0.3		0		6.7	0.2		0		8.7
4 - 5375 - EASTERN AVE @ FERRY ST	0.3		0		1.8	0		0		7.1	0.3		0		7	0		0		8.7
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0		0		1.8	0		0		7.1	0		0.3		6.7	0		0		8.7
6 - 5377 - EASTERN AVE @ FRANKLIN ST	0		0		1.8	0		0.5		6.6	0		0		6.7	0.3		0		9
7 - 5378 - 435 EASTERN AVE	0		0		1.8	0		0		6.6	0		0		6.7	0		0		9
8 - 45378 - LYME ST @ BRYANT ST	0		0		1.8	0		0.3		6.3	0.5		0		7.2	0.5		0.3		9.2
9 - 5379 - 210 LYME ST	0		0		1.8	1		0		7.3	0		0		7.2	0		0		9.2
10 - 5380 - WILLOW ST @ DANIELS ST	0.8		0		2.6	0		0		7.3	0.3		0		7.5	0.3		0		9.5
11 - 5381 - 23 BOWDOIN ST	0		0		2.6	0.3		0		7.6	0		0		7.5	0.5		0.3		9.7
12 - 5382 - 91 BOWDOIN ST	1.3		0		3.9	0		0		7.6	0.5		0		8	2.8		0		12.5
13 - 5383 - BOWDOIN ST @ NEWLAND ST	0		0		3.9	0.8		0.3		8.1	0.8		0		8.8	2.3		0.8		14
14 - 5384 - NEWLAND ST @ ALDEN ST	2.3		0		6.2	0.5		0		8.6	3.5		0		12.3	1.8		0		15.8
15 - 5385 - NEWLAND ST @ BRYANT ST	0		0		6.2	2.3		0		10.9	1.8		0		14.1	1		0		16.8
16 - 5386 - BRYANT ST @ HARVARD ST	0.3		0		6.5	0.5		0.3		11.1	1		0.3		14.8	1.8		0		18.6
17 - 5387 - BRYANT ST @ WILLOW ST	2.5		0		9	1.8		0		12.9	1.3		0		16.1	1		0.5		19.1
18 - 5388 - CROSS ST @ HENRY ST	0		0		9	0.3		0		13.2	1.5		0		17.6	2		0		21.1
19 - 5389 - CROSS ST @ FERRY ST	0.5		0		9.5	1.8		0		15	0.5		0		18.1	0.8		0.3		21.6
20 - 5391 - CROSS ST @ WALNUT ST	0		0		9.5	0		0		15	0.8		0		18.9	0.3		0		21.9
21 - 5392 - CROSS ST @ PELHAM ST	0		0		9.5	0.8		0		15.8	0		0		18.9	0		0		21.9
22 - 5393 - CROSS ST @ HIGH ST	0.5		0		10	0.8		0		16.6	0		0		18.9	0.3		0		22.2
23 - 5394 - CROSS ST @ MAIN ST	0.3		0		10.3	0.3		0		16.9	0.3		0		19.2	0		1.8		20.4
24 - 5395 - MAIN ST @ CONVERSE AVE	1.3		0.5		11.1	0.8		0		17.7	1.3		0.8		19.7	2		0		22.4
25 - 5396 - MAIN ST @ PIERCE AVE	1		0		12.1	2		0		19.7	0.3		0		20	1.3		0.3		23.4
26 - 5397 - MAIN ST @ FLOYD ST	0.3		0		12.4	1.8		0.3		21.2	2		0		22	1.5		0		24.9
27 - 5398 - MAIN ST @ EVERETT ST	0.5		0		12.9	0.3		0		21.5	0.3		0.3		22	1.8		0		26.7
28 - 5399 - MAIN ST @ PRESCOTT ST	1.5		0		14.4	1.5		0		23	0.3		0		22.3	1.8		0.3		28.2
29 - 5400 - MAIN ST @ BALDWIN AVE	1.8		0		16.2	1.3		0		24.3	0.5		0		22.8	0.5		0		28.7
30 - 5401 - 202 MAIN ST	0		0		16.2	1.5		0.5		25.3	0.5		0		23.3	1		0		29.7
31 - 5402 - MAIN ST @ PARLIN ST	0.3		0		16.5	0.5		0		25.8	1		0		24.3	0.5		0		30.2
32 - 5403 - MAIN ST @ TILESTON ST	0		0		16.5	1		0		26.8	0.3		0.8		23.8	0.8		0.3		30.7
33 - 5404 - MAIN ST @ WEST ST	0.3		0.8		16	1.5		0		28.3	2.3		0.3		25.8	1.3		0.5		31.5
34 - 5497 - BROADWAY @ BOWDOIN ST	0		0		16	0.3		0		28.6	0.3		0.3		25.8	0.3		0		31.8
35 - 5498 - BROADWAY OPP BEACHAM ST	0		0		16	0.8		0		29.4	0.5		0		26.3	0		0		31.8
36 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		17	1.3		0		30.7	0.5		0		26.8	1		0.3		32.5
37 - 5500 - BROADWAY @ HORIZON WAY	0		0		17	0		0		30.7	0.3		0		27.1	0		0		32.5
38 - 5501 - OPP 173 ALFORD ST	0		0	4	13	0		0	5	25.7	0		0	14	13.1	0		0	15	17.5
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		13	0		0		25.7	0		0		13.1	0		0		17.5
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		13	0		0		25.7	0		0		13.1	0		0		17.5
41 - 5502 - ALFORD ST @ WEST ST	0		0.3		12.7	0		0		25.7	0		0		13.1	0		0.5		17
42 - 2874 - SULLIVAN STATION - UPPER BUSW	0		15.8		-3.1	0		25.6		0.1	0		25		-11.9	0		28.2		-11.2
Maximum					17					30.7					27.1					32.5
Total	17.8		17.3			31.3		27.8			28.8		27.9			35.6		34.1		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																			
	10:15 (105.1) [4] !Fall 2012!					11:15 (105.1) [4] !Fall 2012!					12:15 (105.1) [4] !Fall 2012!					13:15 (105.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	6.7	2	0		8.7	11.4	2	0		13.4	13.8	3	0		16.8	11.5	3	0		14.5
2 - 5289 - CENTRE ST @ STOP & SHOP	0.3		0		9	1.5		0		14.9	0.8		0		17.6	0.5		0		15
3 - 5373 - 310 MAIN ST	0.2		0		9.2	0		0		14.9	0.5		0.3		17.8	0.8		0		15.8
4 - 5375 - EASTERN AVE @ FERRY ST	0		0.3		8.9	0		0		14.9	0.5		0.3		18	0		0		15.8
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0		0		8.9	0		0.8		14.1	0		1		17	0		0		15.8
6 - 5377 - EASTERN AVE @ FRANKLIN ST	0		0		8.9	0		0		14.1	0.8		0		17.8	0		0.5		15.3
7 - 5378 - 435 EASTERN AVE	0		0.3		8.6	0		0		14.1	0		0		17.8	0		0.5		14.8
8 - 45378 - LYME ST @ BRYANT ST	0.5		0		9.1	0		0		14.1	0		0.5		17.3	0.5		0.5		14.8
9 - 5379 - 210 LYME ST	0		0		9.1	0		0.3		13.8	0		0		17.3	0		0		14.8
10 - 5380 - WILLOW ST @ DANIELS ST	0		0		9.1	0.5		0		14.3	1		0		18.3	0		0		14.8
11 - 5381 - 23 BOWDOIN ST	0		0		9.1	0		0		14.3	1		0		19.3	0		0		14.8
12 - 5382 - 91 BOWDOIN ST	0		0		9.1	0		0		14.3	0.5		0		19.8	0		0		14.8
13 - 5383 - BOWDOIN ST @ NEWLAND ST	1.5		0.5		10.1	0.5		0.5		14.3	1		1.3		19.5	0.5		1.5		13.8
14 - 5384 - NEWLAND ST @ ALDEN ST	1.3		0.3		11.1	0.3		0		14.6	2		1		20.5	1		1		13.8
15 - 5385 - NEWLAND ST @ BRYANT ST	0.8		0		11.9	0.3		0.8		14.1	0.5		1		20	0		0.5		13.3
16 - 5386 - BRYANT ST @ HARVARD ST	0		1		10.9	0		0.5		13.6	0.8		0		20.8	1		0.5		13.8
17 - 5387 - BRYANT ST @ WILLOW ST	0.5		0		11.4	1.8		0		15.4	0.3		0.3		20.8	1		0		14.8
18 - 5388 - CROSS ST @ HENRY ST	1.5		0.3		12.6	0.3		0.3		15.4	0		0		20.8	0.5		0		15.3
19 - 5389 - CROSS ST @ FERRY ST	0.8		0.8		12.6	0.3		0		15.7	0.8		0.3		21.3	3		0		18.3
20 - 5391 - CROSS ST @ WALNUT ST	0.3		0		12.9	0		0		15.7	0		0		21.3	0.5		0		18.8
21 - 5392 - CROSS ST @ PELHAM ST	0		0		12.9	0		0.3		15.4	0.3		0.3		21.3	0		0		18.8
22 - 5393 - CROSS ST @ HIGH ST	0		0		12.9	0		0.3		15.1	0		0		21.3	0		0		18.8
23 - 5394 - CROSS ST @ MAIN ST	0		0		12.9	1.5		0		16.6	0.3		0.3		21.3	0		0		18.8
24 - 5395 - MAIN ST @ CONVERSE AVE	2		0		14.9	0.3		0		16.9	0.5		0.3		21.5	3		0		21.8
25 - 5396 - MAIN ST @ PIERCE AVE	1		0		15.9	0		0.8		16.1	0		0		21.5	0		0		21.8
26 - 5397 - MAIN ST @ FLOYD ST	2.3		0		18.2	0		0		16.1	0		0.5		21	1.5		0		23.3
27 - 5398 - MAIN ST @ EVERETT ST	0		0		18.2	0.3		0		16.4	0		0		21	0.5		0		23.8
28 - 5399 - MAIN ST @ PRESCOTT ST	4		1		21.2	0		0.5		15.9	0.3		0		21.3	0		0		23.8
29 - 5400 - MAIN ST @ BALDWIN AVE	3		0		24.2	0.5		0		16.4	0.3		0		21.6	0		0		23.8
30 - 5401 - 202 MAIN ST	0.8		0		25	0.5		0		16.9	0.3		0		21.9	0		0		23.8
31 - 5402 - MAIN ST @ PARLIN ST	0.8		0.8		25	0		0.3		16.6	0		0.5		21.4	0		0		23.8
32 - 5403 - MAIN ST @ TILESTON ST	0.3		0		25.3	0		0		16.6	0		0.5		20.9	0		0.5		23.3
33 - 5404 - MAIN ST @ WEST ST	2.3		0.5		27.1	0.8		0.3		17.1	0.3		0		21.2	2		0.5		24.8
34 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0.5		26.9	0.5		0		17.6	0		0		21.2	0		0.5		24.3
35 - 5498 - BROADWAY OPP BEACHAM ST	0.5		0		27.4	0.5		1.3		16.8	0		0.3		20.9	0		0		24.3
36 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		28.4	0		0		16.8	0.5		0		21.4	0		0		24.3
37 - 5500 - BROADWAY @ HORIZON WAY	0		0		28.4	0.3		0		17.1	0.3		0		21.7	0		0		24.3
38 - 5501 - OPP 173 ALFORD ST	0		0	8	20.4	0		0	7	10.1	0		0	7	14.7	0		0	7	17.3
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		20.4	0		0		10.1	0		0		14.7	0		0		17.3
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		20.4	0		0		10.1	0		0		14.7	0		0		17.3
41 - 5502 - ALFORD ST @ WEST ST	0		0		20.4	0		0		10.1	0		0		14.7	0		0		17.3
42 - 2874 - SULLIVAN STATION - UPPER BUSW	0		30.2		-9.8	0		16.2		-6.1	0		19		-4.3	0		26.3		-9
Maximum					28.4					17.6					21.9					24.8
Total	32.2		36.2			21.7		22.7			26.9		27.3			27.8		32.8		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	14:20 (105.1) [2] !Fall 2012!					15:25 (105.1) [2] !Fall 2012!					16:30 (105.1) [2] !Fall 2012!					17:35 (105.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	3.3	3	0		6.3	2	3	0		5	5	3	0		8	7.3	2	0		9.3
2 - 5289 - CENTRE ST @ STOP & SHOP	0		0.3		6	2		0		7	0.7		0		8.7	1.3		0.3		10.3
3 - 5373 - 310 MAIN ST	2.7		0		8.7	4.3		0		11.3	1		0		9.7	1		0		11.3
4 - 5375 - EASTERN AVE @ FERRY ST	0		0		8.7	0.3		0		11.6	0.7		0		10.4	0.3		0.3		11.3
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0.3		0.7		8.3	0.7		0.7		11.6	0.3		0.3		10.4	0.3		0.3		11.3
6 - 5377 - EASTERN AVE @ FRANKLIN ST	0		0		8.3	0.5		0		12.1	0		0.5		9.9	0		0.5		10.8
7 - 5378 - 435 EASTERN AVE	0		0		8.3	0		0		12.1	0		0		9.9	0		0		10.8
8 - 45378 - LYME ST @ BRYANT ST	1		0		9.3	0		0		12.1	0		0		9.9	0		1		9.8
9 - 5379 - 210 LYME ST	0		0		9.3	0		0.5		11.6	0.5		0		10.4	0		0.5		9.3
10 - 5380 - WILLOW ST @ DANIELS ST	0		0		9.3	0		0		11.6	0		0.5		9.9	0		0.5		8.8
11 - 5381 - 23 BOWDOIN ST	1		0		10.3	0		0		11.6	1.5		0		11.4	0		0.5		8.3
12 - 5382 - 91 BOWDOIN ST	0		0		10.3	0		0		11.6	0		0		11.4	0		0		8.3
13 - 5383 - BOWDOIN ST @ NEWLAND ST	0		0		10.3	0		0		11.6	0		0		11.4	2		3		7.3
14 - 5384 - NEWLAND ST @ ALDEN ST	1		0		11.3	0.5		0		12.1	0.5		0		11.9	0		1.5		5.8
15 - 5385 - NEWLAND ST @ BRYANT ST	0.5		0		11.8	0		0		12.1	1.5		0		13.4	0		2		3.8
16 - 5386 - BRYANT ST @ HARVARD ST	1.5		1		12.3	0		0		12.1	0		0		13.4	0.5		0		4.3
17 - 5387 - BRYANT ST @ WILLOW ST	0.5		0		12.8	0		0		12.1	1.5		0		14.9	0		0		4.3
18 - 5388 - CROSS ST @ HENRY ST	2		0.5		14.3	0.5		0		12.6	0		0		14.9	0		0.5		3.8
19 - 5389 - CROSS ST @ FERRY ST	1.7		0.3		15.7	1.3		0.7		13.2	1.3		0.7		15.5	2.3		0.7		5.4
20 - 5391 - CROSS ST @ WALNUT ST	0.5		0		16.2	0		0		13.2	0		0		15.5	0		0		5.4
21 - 5392 - CROSS ST @ PELHAM ST	0.5		0		16.7	0		0		13.2	0		0		15.5	0.5		0		5.9
22 - 5393 - CROSS ST @ HIGH ST	0		0		16.7	0		0.5		12.7	0		1		14.5	0.5		0.5		5.9
23 - 5394 - CROSS ST @ MAIN ST	0		0.5		16.2	0		0.5		12.2	0		1		13.5	0		0.5		5.4
24 - 5395 - MAIN ST @ CONVERSE AVE	1		0.5		16.7	0		0.5		11.7	0.5		0.5		13.5	1.5		0		6.9
25 - 5396 - MAIN ST @ PIERCE AVE	0		0		16.7	0.5		0		12.2	0		0		13.5	0		0		6.9
26 - 5397 - MAIN ST @ FLOYD ST	0.5		0		17.2	0.5		0		12.7	0		0		13.5	0		0		6.9
27 - 5398 - MAIN ST @ EVERETT ST	0		0		17.2	1.5		0		14.2	0		0		13.5	0		0		6.9
28 - 5399 - MAIN ST @ PRESCOTT ST	0		0		17.2	1		2		13.2	0		0		13.5	2.5		0		9.4
29 - 5400 - MAIN ST @ BALDWIN AVE	0.3		0.3		17.2	0		0.7		12.5	1.3		0.3		14.5	0		0.3		9.1
30 - 5401 - 202 MAIN ST	1		0		18.2	0		0.3		12.2	0		0.5		14	1.5		0		10.6
31 - 5402 - MAIN ST @ PARLIN ST	0		0		18.2	0		0		12.2	0		0		14	0		0		10.6
32 - 5403 - MAIN ST @ TILESTON ST	5		0.7		22.5	2.7		3.3		11.6	1		1		14	2.7		0		13.3
33 - 5404 - MAIN ST @ WEST ST	2		0		24.5	1.3		0.7		12.2	0		0		14	1		0.7		13.6
34 - 5497 - BROADWAY @ BOWDOIN ST	1		0		25.5	2.3		0		14.5	0		0		14	0		0		13.6
35 - 5498 - BROADWAY OPP BEACHAM ST	1		0		26.5	0.7		0.7		14.5	0		0		14	1		1.3		13.3
36 - 5499 - BROADWAY OPP THORNDIKE ST	2.3		0.7		28.1	0.7		0.7		14.5	0		0		14	0.3		0		13.6
37 - 5500 - BROADWAY @ HORIZON WAY	0		0		28.1	0		0		14.5	0		0		14	0		0		13.6
38 - 5501 - OPP 173 ALFORD ST	0		0	7	21.1	0		0	7	7.5	0		0	10	4	0		0	14	-0.4
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		21.1	0		0		7.5	0		0		4	0		0		-0.4
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		21.1	0		0		7.5	0		0		4	0		0		-0.4
41 - 5502 - ALFORD ST @ WEST ST	0		0.7		20.4	0		0		7.5	0		0		4	0		0		-0.4
42 - 2874 - SULLIVAN STATION - UPPER BUSW	0		25		-4.6	0		15		-7.5	0		10		-6	0		14		-14.4
Maximum					28.1					14.5					15.5					13.6
Total	30.7		31.2			23.3		26.7			17.3		16.3			26.7		29		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	18:40 (105.1) [2] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 53270 - MALDEN CTR STA EAST BUSWAY BA	10.3	2	0		12.3	90.4	0	117.4
2 - 5289 - CENTRE ST @ STOP & SHOP	1.3		0		13.6	9.1	1.2	125.3
3 - 5373 - 310 MAIN ST	0		0		13.6	11.3	0.3	136.3
4 - 5375 - EASTERN AVE @ FERRY ST	0		0		13.6	2.4	0.9	137.8
5 - 5376 - EASTERN AVE @ PHILLIPS CT	0		0		13.6	1.6	4.1	135.3
6 - 5377 - EASTERN AVE @ FRANKLIN ST	0		0.5		13.1	1.6	2.5	134.4
7 - 5378 - 435 EASTERN AVE	0		0		13.1	0	0.8	133.6
8 - 45378 - LYME ST @ BRYANT ST	0		1		12.1	3	3.6	133
9 - 5379 - 210 LYME ST	0		0		12.1	1.5	1.3	133.2
10 - 5380 - WILLOW ST @ DANIELS ST	0		0		12.1	2.9	1	135.1
11 - 5381 - 23 BOWDOIN ST	0		0		12.1	4.3	0.8	138.6
12 - 5382 - 91 BOWDOIN ST	1.5		0.5		13.1	6.6	0.5	144.7
13 - 5383 - BOWDOIN ST @ NEWLAND ST	0		0.5		12.6	9.4	8.4	145.7
14 - 5384 - NEWLAND ST @ ALDEN ST	0		0		12.6	14.7	3.8	156.6
15 - 5385 - NEWLAND ST @ BRYANT ST	0		0.5		12.1	8.7	4.8	160.5
16 - 5386 - BRYANT ST @ HARVARD ST	0		0		12.1	7.4	3.6	164.3
17 - 5387 - BRYANT ST @ WILLOW ST	0		0		12.1	12.2	0.8	175.7
18 - 5388 - CROSS ST @ HENRY ST	0		0		12.1	8.6	1.6	182.7
19 - 5389 - CROSS ST @ FERRY ST	1.3		4		9.4	16.4	7.8	191.3
20 - 5391 - CROSS ST @ WALNUT ST	0		0.5		8.9	2.4	0.5	193.2
21 - 5392 - CROSS ST @ PELHAM ST	0		0.5		8.4	2.1	1.1	194.2
22 - 5393 - CROSS ST @ HIGH ST	0		0		8.4	2.1	2.3	194
23 - 5394 - CROSS ST @ MAIN ST	1.5		0		9.9	4.2	4.6	193.6
24 - 5395 - MAIN ST @ CONVERSE AVE	0		2.5		7.4	14.2	5.6	202.2
25 - 5396 - MAIN ST @ PIERCE AVE	1		1		7.4	7.1	2.1	207.2
26 - 5397 - MAIN ST @ FLOYD ST	0		0		7.4	10.4	0.8	216.8
27 - 5398 - MAIN ST @ EVERETT ST	0		0		7.4	5.2	0.3	221.7
28 - 5399 - MAIN ST @ PRESCOTT ST	0		0		7.4	12.9	3.8	230.8
29 - 5400 - MAIN ST @ BALDWIN AVE	1.7		0.3		8.8	11.2	1.9	240.1
30 - 5401 - 202 MAIN ST	0		0		8.8	7.1	1.3	245.9
31 - 5402 - MAIN ST @ PARLIN ST	0		0		8.8	3.1	1.6	247.4
32 - 5403 - MAIN ST @ TILESTON ST	0.7		1		8.5	14.5	8.1	253.8
33 - 5404 - MAIN ST @ WEST ST	0		0		8.5	15.1	4.3	264.6
34 - 5497 - BROADWAY @ BOWDOIN ST	0		0		8.5	5	1.3	268.3
35 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0		8.8	5.3	3.6	270
36 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		9.8	9.6	1.7	277.9
37 - 5500 - BROADWAY @ HORIZON WAY	0		0		9.8	0.9	0	278.8
38 - 5501 - OPP 173 ALFORD ST	0		0	14	-4.2	0	0	159.8
39 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		-4.2	0	0	159.8
40 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		-4.2	0	0	159.8
41 - 5502 - ALFORD ST @ WEST ST	0		0		-4.2	0	1.5	158.3
42 - 2874 - SULLIVAN STATION - UPPER BUSW	0		8		-12.2	0	258.3	-100
Maximum					13.6	0	0	285.3
Total	20.7		20.8			340.8	350.1	0

Massachusetts Bay Transportation Authority
Route 105
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:45 (105.1) [4] !Fall 2012!					07:45 (105.1) [4] !Fall 2012!					08:45 (105.1) [4] !Fall 2012!					09:45 (105.1) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	1.8		0		1.8	4		0		4	5.8		0		5.8	7.8		0		7.8
2 - 5504 - ALFORD ST @ MAIN ST	0		0		1.8	0		0		4	0.3		0		6.1	0		0		7.8
3 - 5505 - 173 ALFORD ST	0	1	0		2.8	0	1	0		5	0	1	0		7.1	0	3	0		10.8
4 - 5506 - BROADWAY @ DEXTER ST	0		0		2.8	0		0		5	0		0		7.1	0		0		10.8
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		2.8	0		0		5	0		0.3		6.8	0.3		0		11.1
6 - 5508 - BROADWAY @ LANGDON ST	0.3		0		3.1	0.8		0.3		5.5	0		0.5		6.3	0.3		0		11.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		3.1	0		0		5.5	0		1.3		5	0		0		11.4
8 - 5405 - MAIN ST @ ELMWOOD ST	0		0		3.1	0		0.3		5.2	0.5		0.3		5.2	0		0		11.4
9 - 5406 - MAIN ST @ OAKES ST	0		0		3.1	0.8		0		6	0		0.5		4.7	0		0		11.4
10 - 45406 - MAIN ST @ WINTHROP ST	0		0		3.1	0		0		6	0		0		4.7	0		0		11.4
11 - 5407 - MAIN ST @ FOREST AVE	0		0		3.1	0		0		6	0		0		4.7	0.3		0		11.7
12 - 5408 - MAIN ST @ BALDWIN AVE	0		0		3.1	0		0		6	0		0		4.7	0		0		11.7
13 - 5409 - MAIN ST @ CLARK ST	0		0		3.1	0.3		0.5		5.8	0		0		4.7	0		0		11.7
14 - 5410 - MAIN ST @ DYER AVE	0		0		3.1	0		0.3		5.5	0.3		0.5		4.5	0		0.3		11.4
15 - 5411 - MAIN ST @ BRADFORD ST	0		0		3.1	0.3		0		5.8	0.8		0.3		5	0		0.3		11.1
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		0		3.1	0		0		5.8	0.5		0.3		5.2	0		0.3		10.8
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		3.1	0		0.3		5.5	0.3		0		5.5	0.3		0.3		10.8
18 - 5414 - CROSS ST @ MAIN ST	0		0		3.1	0		0		5.5	0		0.3		5.2	0		0		10.8
19 - 5415 - CROSS ST @ STEVENS ST	0		0		3.1	0		0		5.5	0		0		5.2	0		0		10.8
20 - 5416 - CROSS ST @ PRATT ST	0		0		3.1	0.3		0		5.8	0		0		5.2	0		0		10.8
21 - 5417 - CROSS ST @ WALNUT ST	0		0		3.1	0		0		5.8	0		0.3		4.9	0.3		0		11.1
22 - 5418 - CROSS ST @ FERRY ST	0.5		0.5		3.1	0		0.8		5	0		0		4.9	0.5		0		11.6
23 - 5419 - CROSS ST @ HENRY ST	0		0		3.1	1.3		1		5.3	0.8		0.3		5.4	1.8		0.8		12.6
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	0		0		3.1	0.3		0		5.6	0.5		0		5.9	0.8		0.3		13.1
25 - 5421 - BRYANT ST @ HARVARD ST	1.8		0		4.9	0		0		5.6	1.3		0		7.2	0.5		0		13.6
26 - 5422 - NEWLAND ST @ BRYANT ST	1.5		0		6.4	0.8		0		6.4	2.3		0.3		9.2	2		0.3		15.3
27 - 5423 - 218 NEWLAND ST	1		0		7.4	3.3		0		9.7	4		0.3		12.9	1.5		0.3		16.5
28 - 5424 - 172 BOWDOIN ST	0.3		0		7.7	2		0.5		11.2	2.8		0.5		15.2	1.5		0.3		17.7
29 - 5425 - BOWDOIN ST OPP HARVARD ST	1		0		8.7	1		0		12.2	0.8		0		16	0.3		0.3		17.7
30 - 5426 - BOWDOIN ST @ WILLOW ST	0.8		0		9.5	1.3		0.8		12.7	1.8		0		17.8	0.5		0		18.2
31 - 5427 - WILLOW ST @ LYME ST	0		0		9.5	0		0		12.7	0		0		17.8	0		0.3		17.9
32 - 5428 - LYME ST @ CROSS ST	0		0		9.5	0		0		12.7	1		0		18.8	0.8		0		18.7
33 - 45428 - LYME ST @ BRYANT ST	2.3		0		11.8	1		0		13.7	1.5		0		20.3	0.3		0		19
34 - 5429 - 420 EASTERN AVE	0		0		11.8	0		0		13.7	0		0		20.3	0		0		19
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		0		11.8	0.3		0.3		13.7	0.5		0		20.8	1.5		0		20.5
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0		0		11.8	0.3		0		14	0.3		0.3		20.8	0		0		20.5
37 - 5365 - EASTERN AVE @ MAIN ST	0.3		0		12.1	0		0.5		13.5	1.3		0		22.1	0		0		20.5
38 - 5366 - MAIN ST @ CENTRE ST	0.3		0		12.4	0		1		12.5	0		0.5		21.6	0		1		19.5
39 - 5342 - MAIN ST OPP PLEASANT ST	0		0		12.4	0		1.3		11.2	0		2		19.6	0.3		2.5		17.3
40 - 9215 - MAIN ST @ SALEM ST	0.3		0		12.7	0		0.3		10.9	0		0		19.6	0.3		1		16.6
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0.5		0		13.2	0		0		10.9	0		0.8		18.8	0.8		0.8		16.6
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		13.2	0		0.8		10.1	0.5		0		19.3	0		0.3		16.3
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		10.2	1	2	0		7	1	2.1	0		14.8	1	3.5	0		8.2	3	5.1
Maximum					13.2					14					22.1					20.5
Total	12.3		10.7			17.5		15.5			27.3		23.8			22.1		17		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																			
	10:45 (105.1) [4] !Fall 2012!					11:45 (105.1) [4] !Fall 2012!					12:45 (105.1) [2] !Fall 2012!					13:45 (105.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	8.5		0		8.5	6		0		6	10		0		10	29		0		29
2 - 5504 - ALFORD ST @ MAIN ST	0		0		8.5	0		0		6	2		0		12	0		0.3		28.7
3 - 5505 - 173 ALFORD ST	0	3	0		11.5	0	3	0		9	0	3	0		15	0	3	0		31.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0		11.5	0		0		9	0		0		15	0		0		31.7
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		11.5	0.5		0.3		9.2	0		0		15	0		1		30.7
6 - 5508 - BROADWAY @ LANGDON ST	0.3		0		11.8	0		0.3		8.9	0.5		0		15.5	0		0.3		30.4
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		11.8	0		0		8.9	0		0		15.5	0		0		30.4
8 - 5405 - MAIN ST @ ELMWOOD ST	0.3		0.5		11.6	0		0		8.9	0		0		15.5	4.3		0.3		34.4
9 - 5406 - MAIN ST @ OAKES ST	0		0.3		11.3	0		0.5		8.4	0		1.5		14	1		3.7		31.7
10 - 45406 - MAIN ST @ WINTHROP ST	0.3		0		11.6	0		0		8.4	0		0		14	2		2.3		31.4
11 - 5407 - MAIN ST @ FOREST AVE	0		0.3		11.3	0		0		8.4	0		0.5		13.5	0		1		30.4
12 - 5408 - MAIN ST @ BALDWIN AVE	0.3		0		11.6	0		0.3		8.1	0		0		13.5	0		0.3		30.1
13 - 5409 - MAIN ST @ CLARK ST	0		0		11.6	0		0.8		7.3	0		0		13.5	1		0.5		30.6
14 - 5410 - MAIN ST @ DYER AVE	0		0.3		11.3	0.5		0		7.8	0		0		13.5	0		0		30.6
15 - 5411 - MAIN ST @ BRADFORD ST	0.3		0.5		11.1	0.3		0		8.1	0		1		12.5	0.5		0.5		30.6
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0.5		0.5		11.1	0.5		0		8.6	0		0		12.5	1		0.5		31.1
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		11.1	0		0.5		8.1	0		0		12.5	0.5		0		31.6
18 - 5414 - CROSS ST @ MAIN ST	0.8		1.3		10.6	0		0		8.1	0		0		12.5	0		0		31.6
19 - 5415 - CROSS ST @ STEVENS ST	0.3		0.3		10.6	0		0		8.1	0		0		12.5	0		0		31.6
20 - 5416 - CROSS ST @ PRATT ST	0		0.3		10.3	0		0		8.1	0		0		12.5	0		0.5		31.1
21 - 5417 - CROSS ST @ WALNUT ST	0		0		10.3	0		0.3		7.8	0		0.5		12	0		0		31.1
22 - 5418 - CROSS ST @ FERRY ST	0		0		10.3	0.3		1.3		6.8	0		0		12	0.5		3		28.6
23 - 5419 - CROSS ST @ HENRY ST	0.3		0		10.6	0.5		0		7.3	0		0.5		11.5	0.5		2.5		26.6
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	2.3		1.3		11.6	0.5		0.3		7.5	0.5		0		12	0		2.5		24.1
25 - 5421 - BRYANT ST @ HARVARD ST	0.3		0.3		11.6	0		0.3		7.2	0		0.5		11.5	0.5		0		24.6
26 - 5422 - NEWLAND ST @ BRYANT ST	1		0		12.6	0.5		0.8		6.9	0		0		11.5	6		1		29.6
27 - 5423 - 218 NEWLAND ST	3		0.5		15.1	3		0.5		9.4	3		0.5		14	1.5		6.5		24.6
28 - 5424 - 172 BOWDOIN ST	2.5		0.5		17.1	3.8		0.3		12.9	2		0		16	0.5		0		25.1
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0.8		0.3		17.6	0.8		0		13.7	0		0		16	1		0.5		25.6
30 - 5426 - BOWDOIN ST @ WILLOW ST	2.3		0.5		19.4	0.3		0		14	1.5		0		17.5	1		0.5		26.1
31 - 5427 - WILLOW ST @ LYME ST	0		0		19.4	0		0		14	0		0		17.5	0		2.5		23.6
32 - 5428 - LYME ST @ CROSS ST	0.5		0		19.9	0		0		14	1.5		0		19	0.5		0		24.1
33 - 45428 - LYME ST @ BRYANT ST	1		0		20.9	0.8		0		14.8	0.5		0		19.5	2.5		0		26.6
34 - 5429 - 420 EASTERN AVE	0		0.3		20.6	0		0		14.8	0		0		19.5	0.5		0		27.1
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		0		20.6	0.5		0.3		15	1.5		1.5		19.5	1		0		28.1
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0		0		20.6	0		0		15	0		0		19.5	1.7		0		29.8
37 - 5365 - EASTERN AVE @ MAIN ST	0.3		0		20.9	0		0.5		14.5	0		0		19.5	0.3		0.3		29.8
38 - 5366 - MAIN ST @ CENTRE ST	0		0.8		20.1	0		0.8		13.7	0		1.5		18	0		1.7		28.1
39 - 5342 - MAIN ST OPP PLEASANT ST	0		1		19.1	0		0		13.7	0.5		1.5		17	0		2.3		25.8
40 - 9215 - MAIN ST @ SALEM ST	0		1		18.1	0		0		13.7	0		0		17	0.5		0		26.3
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0.5		17.6	0		0.5		13.2	0		1		16	0.5		0.5		26.3
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		17.6	0		0		13.2	0		0		16	0		0		26.3
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		14.5	3	0.1	0		11.3	3	-1.1	0		10.7	3	2.3	0		20.3	3	3
Maximum					20.9					15					19.5					34.4
Total	25.3		25.3			18.5		19.3			23.5		21.2			58.3		55.5		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	14:53 (105.1) [2] !Fall 2012!					15:58 (105.1) [2] !Fall 2012!					17:03 (105.1) [2] !Fall 2012!					18:08 (105.1) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	38.3		0		38.3	41		0		41	29		0		29	41.7		0		41.7
2 - 5504 - ALFORD ST @ MAIN ST	0.3		0		38.6	0		0.3		40.7	0		0		29	0		0		41.7
3 - 5505 - 173 ALFORD ST	0	3	0		41.6	0	6	0		46.7	0	2	0		31	0	2	0		43.7
4 - 5506 - BROADWAY @ DEXTER ST	0		0.3		41.3	0		0		46.7	0		0		31	0		0		43.7
5 - 5507 - BROADWAY @ THORNDIKE ST	0.7		0.3		41.7	0		1.3		45.4	0		0		31	0		1.3		42.4
6 - 5508 - BROADWAY @ LANGDON ST	0.3		1		41	0		0.3		45.1	0		0		31	0		1.3		41.1
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.3		40.7	1		0.7		45.4	0		0		31	0		0		41.1
8 - 5405 - MAIN ST @ ELMWOOD ST	0.3		0.3		40.7	0.3		1		44.7	0.3		1.7		29.6	0.3		1.3		40.1
9 - 5406 - MAIN ST @ OAKES ST	1.7		2.3		40.1	0.7		3.7		41.7	2		1.7		29.9	2		4		38.1
10 - 45406 - MAIN ST @ WINTHROP ST	0.3		2.3		38.1	0.3		4		38	0		1		28.9	1.3		0.7		38.7
11 - 5407 - MAIN ST @ FOREST AVE	0.3		2.7		35.7	0.7		2		36.7	0		0		28.9	0		1		37.7
12 - 5408 - MAIN ST @ BALDWIN AVE	0		1.3		34.4	0		1		35.7	0.3		2		27.2	0		0		37.7
13 - 5409 - MAIN ST @ CLARK ST	0		1.5		32.9	0		0		35.7	0.5		0.5		27.2	0		0		37.7
14 - 5410 - MAIN ST @ DYER AVE	0		0		32.9	0		1.5		34.2	0		0		27.2	0.5		1.5		36.7
15 - 5411 - MAIN ST @ BRADFORD ST	0		2		30.9	0		1.5		32.7	0		0.5		26.7	0		0.5		36.2
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0.5		1.5		29.9	0		0.5		32.2	0		0.5		26.2	0.5		1.5		35.2
17 - 5413 - MAIN ST @ CLARENDON ST	0		0		29.9	0		1		31.2	0.5		1		25.7	0		0.5		34.7
18 - 5414 - CROSS ST @ MAIN ST	0.5		0		30.4	0		1		30.2	0		0.5		25.2	0		0		34.7
19 - 5415 - CROSS ST @ STEVENS ST	0.5		3.5		27.4	0		0		30.2	0		0		25.2	0		1		33.7
20 - 5416 - CROSS ST @ PRATT ST	0		0		27.4	0		1.5		28.7	0		0.5		24.7	0		2.5		31.2
21 - 5417 - CROSS ST @ WALNUT ST	0		0		27.4	0		4		24.7	0		0		24.7	0		1		30.2
22 - 5418 - CROSS ST @ FERRY ST	0		0		27.4	0.5		1.5		23.7	0.5		1.5		23.7	0		5		25.2
23 - 5419 - CROSS ST @ HENRY ST	0.5		2		25.9	0		2		21.7	0		3		20.7	0		2.5		22.7
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	1		1		25.9	0.5		1		21.2	0		1		19.7	0		0		22.7
25 - 5421 - BRYANT ST @ HARVARD ST	0		0		25.9	0.5		1		20.7	1		1.5		19.2	0		0		22.7
26 - 5422 - NEWLAND ST @ BRYANT ST	1.7		6		21.6	1.7		5		17.4	1		3.7		16.5	1.3		6.3		17.7
27 - 5423 - 218 NEWLAND ST	0.5		3		19.1	0.5		1.5		16.4	1		1		16.5	0		1.5		16.2
28 - 5424 - 172 BOWDOIN ST	1		1.5		18.6	1		1		16.4	0.5		2		15	1		2		15.2
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0		0.5		18.1	0		0.5		15.9	0		1		14	0		1		14.2
30 - 5426 - BOWDOIN ST @ WILLOW ST	2		0.5		19.6	2		0		17.9	0		0.5		13.5	0		1.5		12.7
31 - 5427 - WILLOW ST @ LYME ST	0		0		19.6	0		1.5		16.4	0		0		13.5	0		0		12.7
32 - 5428 - LYME ST @ CROSS ST	1		0		20.6	0		0.5		15.9	0.5		0		14	0		1.5		11.2
33 - 45428 - LYME ST @ BRYANT ST	0		0		20.6	0		0		15.9	0		0.5		13.5	0		2		9.2
34 - 5429 - 420 EASTERN AVE	0		1		19.6	0		0		15.9	0		0		13.5	0		1.5		7.7
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		2.5		17.1	0		0		15.9	0		0		13.5	0		0		7.7
36 - 5431 - EASTERN AVE @ PHILLIPS CT	1.3		1		17.4	1		0.3		16.6	0		2.3		11.2	0.3		1.7		6.3
37 - 5365 - EASTERN AVE @ MAIN ST	0		1		16.4	0		0.7		15.9	0		0.7		10.5	0		0		6.3
38 - 5366 - MAIN ST @ CENTRE ST	0		2.7		13.7	0		0.3		15.6	0		0.3		10.2	0		0.7		5.6
39 - 5342 - MAIN ST OPP PLEASANT ST	0		0.7		13	0		0.7		14.9	0.5		1		9.7	0		0.3		5.3
40 - 9215 - MAIN ST @ SALEM ST	0		1		12	0		0.7		14.2	0		0		9.7	0		0		5.3
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0		1		11	0		0		14.2	0		0		9.7	0		0		5.3
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		11	0		0		14.2	0		0		9.7	0		1.7		3.6
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		7.3	3	0.7	0		10	6	-1.8	0		6.7	2	1	0		4.3	2	-2.7
Maximum					41.7					46.7					31					43.7
Total	52.8		52.2			51.7		53.5			37.7		36.5			49		51.7		

Massachusetts Bay Transportation Authority
Route 105
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	19:10 (105.1) [2] !Fall 2012!					Total		
	On	BuildOn	Off	BuildOff	Load	On	Off	Load
1 - 2874 - SULLIVAN STATION - UPPER BUSW	13		0		13	235.9	0	235.9
2 - 5504 - ALFORD ST @ MAIN ST	0		0		13	2.6	0.6	237.9
3 - 5505 - 173 ALFORD ST	0	2	0		15	0	0	270.9
4 - 5506 - BROADWAY @ DEXTER ST	0		0		15	0	0.3	270.6
5 - 5507 - BROADWAY @ THORNDIKE ST	0		0		15	1.5	4.5	267.6
6 - 5508 - BROADWAY @ LANGDON ST	0		0		15	2.5	4	266.1
7 - 5509 - BROADWAY ST @ BARTLETT ST	0		1.5		13.5	1	3.8	263.3
8 - 5405 - MAIN ST @ ELMWOOD ST	0		0		13.5	6.3	5.7	263.9
9 - 5406 - MAIN ST @ OAKES ST	0.5		0.5		13.5	8.7	18.7	253.9
10 - 45406 - MAIN ST @ WINTHROP ST	0		0		13.5	4.2	10.3	247.8
11 - 5407 - MAIN ST @ FOREST AVE	0		0		13.5	1.3	7.5	241.6
12 - 5408 - MAIN ST @ BALDWIN AVE	0		0		13.5	0.6	4.9	237.3
13 - 5409 - MAIN ST @ CLARK ST	0		1.5		12	1.8	5.3	233.8
14 - 5410 - MAIN ST @ DYER AVE	0		0		12	1.3	4.4	230.7
15 - 5411 - MAIN ST @ BRADFORD ST	0		2.5		9.5	2.2	9.6	223.3
16 - 5412 - MAIN ST @ BELLINGHAM AVE	0		0		9.5	3.5	5.6	221.2
17 - 5413 - MAIN ST @ CLARENDON ST	0		1		8.5	1.6	4.6	218.2
18 - 5414 - CROSS ST @ MAIN ST	0.5		0		9	1.8	3.1	216.9
19 - 5415 - CROSS ST @ STEVENS ST	0		0		9	0.8	4.8	212.9
20 - 5416 - CROSS ST @ PRATT ST	0		1		8	0.3	6.3	206.9
21 - 5417 - CROSS ST @ WALNUT ST	0		0		8	0.3	6.1	201.1
22 - 5418 - CROSS ST @ FERRY ST	0		1		7	2.8	14.6	189.3
23 - 5419 - CROSS ST @ HENRY ST	0		0.5		6.5	5.7	15.1	179.9
24 - 5420 - OPP 314 BRYANT ST @ SUFFOLK M	0		0		6.5	6.4	7.4	178.9
25 - 5421 - BRYANT ST @ HARVARD ST	0		0		6.5	5.9	3.6	181.2
26 - 5422 - NEWLAND ST @ BRYANT ST	0		2		4.5	19.8	25.4	175.6
27 - 5423 - 218 NEWLAND ST	0		0		4.5	22.3	15.6	182.3
28 - 5424 - 172 BOWDOIN ST	0		0.5		4	18.9	9.1	192.1
29 - 5425 - BOWDOIN ST OPP HARVARD ST	0		0		4	5.7	4.1	193.7
30 - 5426 - BOWDOIN ST @ WILLOW ST	0.5		0		4.5	14	4.3	203.4
31 - 5427 - WILLOW ST @ LYME ST	0.5		0		5	0.5	4.3	199.6
32 - 5428 - LYME ST @ CROSS ST	0		0		5	5.8	2	203.4
33 - 45428 - LYME ST @ BRYANT ST	0		0		5	9.9	2.5	210.8
34 - 5429 - 420 EASTERN AVE	0		0		5	0.5	2.8	208.5
35 - 5430 - EASTERN AVE @ FRANKLIN ST	0		0.5		4.5	5.3	5.1	208.7
36 - 5431 - EASTERN AVE @ PHILLIPS CT	0		0		4.5	4.9	5.6	208
37 - 5365 - EASTERN AVE @ MAIN ST	0		0		4.5	2.2	3.7	206.5
38 - 5366 - MAIN ST @ CENTRE ST	0		0		4.5	0.3	11.3	195.5
39 - 5342 - MAIN ST OPP PLEASANT ST	0.5		0		5	1.8	13.3	184
40 - 9215 - MAIN ST @ SALEM ST	0		0		5	1.1	4	181.1
41 - 19215 - FLORENCE ST @ RAMSDELL RD	0		0		5	1.8	5.1	177.8
42 - 5369 - FLORENCE ST @ WASHINGTON ST	0		0		5	0.5	2.8	175.5
43 - 53270 - MALDEN CTR STA EAST BUSWAY BA	0		3	2	0	0	128.3	14.2
Maximum					15	0	0	337.7
Total	15.5		15.5			411.5	397.7	0

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	05:00 (109.1) [11] !Fall 2012!					05:02 (109.0) [11] !Fall 2012!					05:21 (109.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	.		.		#VALUE!	3.6	0	0		3.6	1.7	0	0		1.7
800 - 5473 - EASTERN AVE @ LYNN ST	.		.		#VALUE!	0		0		3.6	0		0		1.7
1200 - 5474 - EASTERN AVE @ CLAPP ST	.		.		#VALUE!	0.1		0		3.7	0		0		1.7
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	.		.		#VALUE!	1.3		0		5	0		0		1.7
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	.		.		#VALUE!	0		0		5	0		0		1.7
2400 - 5477 - 1236 EASTERN AVE	.		.		#VALUE!	0		0		5	0		0		1.7
2800 - 5478 - BROADWAY @ EASTERN AVE	.		.		#VALUE!	1.5		0		6.5	0.3		0		2
3200 - 5480 - BROADWAY @ SHEAFE ST	.		.		#VALUE!	1		0		7.5	0		0		2
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	.		.		#VALUE!	0.1		0		7.6	0.7		0		2.7
4000 - 5482 - 990 BROADWAY OPP GROVER ST	.		.		#VALUE!	4.7		0		12.3	0.3		0		3
4400 - 5483 - BROADWAY @ SHUTE ST	.		.		#VALUE!	1.5		0.1		13.7	2.7		0		5.7
4800 - 5484 - BROADWAY @ CAMERON ST	.		.		#VALUE!	3.5		0.5		16.7	2.7		0		8.4
5200 - 5485 - BROADWAY @ KENWOOD RD	.		.		#VALUE!	1.5		0		18.2	0.7		0		9.1
5600 - 5486 - BROADWAY @ EDITH AVE	.		.		#VALUE!	2.1		0		20.3	0		0		9.1
6000 - 5487 - BROADWAY @ MARIE AVE	.		.		#VALUE!	0.6		0		20.9	1		0		10.1
6400 - 5488 - BROADWAY @ FERRY ST	0	1	0		1	2.6		0.1		23.4	3.3		0		13.4
6800 - 5489 - BROADWAY @ WAVERLY AVE	14.6		0		15.6	2.3		0		25.7	0.7		0		14.1
7200 - 5490 - BROADWAY @ RAYMOND ST	11.8		0.2		27.2	3.3		0.2		28.8	1.7		0		15.8
7600 - 5492 - BROADWAY @ HANCOCK ST	8.3		0.1		35.4	1.8		0		30.6	4.7		0.7		19.8
8000 - 5493 - BROADWAY @ PLEASANT ST	4.4		0.1		39.7	2.3		0.1		32.8	0		0.3		19.5
8400 - 5494 - BROADWAY @ WEBSTER ST	2.8		0.3		42.2	0.7		0.1		33.4	1.7		0.3		20.9
8800 - 5495 - BROADWAY @ CHURCH ST	0.9		0.1		43	0.9		0		34.3	0		0		20.9
9200 - 5496 - BROADWAY @ NORWOOD ST	16		0.2		58.8	8.7		0.1		42.9	3		0		23.9
9600 - 5559 - BROADWAY OPP SECOND ST	0.6		0.1		59.3	0.5		0		43.4	0.7		0		24.6
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.9		0		60.2	2.5		0.2		45.7	1.7		0		26.3
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0.1		60.6	0.5		0		46.2	0.3		0		26.6
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.6		0.3		60.9	0.6		0.3		46.5	0		0		26.6
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.6		0		61.5	0.6		0.5		46.6	0.3		0		26.9
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		61.5	0		0		46.6	0		0		26.9
12000 - 5501 - OPP 173 ALFORD ST	0.2		0.3	0	61.4	0		0	0	46.6	0		0	0	26.9
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		61.4	0		0		46.6	0		0		26.9
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		61.4	0		0		46.6	0		0		26.9
13200 - 5502 - ALFORD ST @ WEST ST	0		0.1		61.3	0		0		46.6	0		0		26.9
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	0		0		61.3	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		60.6		0.7	0		46.8		-0.2	0		26.7		0.2
Maximum					61.5					46.6					26.9
Total	62.4		62.4			48.9		48.9			28		28		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	05:40 (109.0) [11] !Fall 2012!					05:54 (109.0) [4] !Fall 2012!					06:06 (109.0) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	1.5	0	0		1.5	4	0	0		4	2.3	0	0		2.3
800 - 5473 - EASTERN AVE @ LYNN ST	0.9		0		2.4	0.3		0		4.3	0.7		0		3
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.2		0		2.6	0		0		4.3	0		0		3
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		2.6	0		0		4.3	0.5		0		3.5
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0.2		0		2.8	0		0		4.3	0.1		0		3.6
2400 - 5477 - 1236 EASTERN AVE	0		0		2.8	0		0		4.3	0		0		3.6
2800 - 5478 - BROADWAY @ EASTERN AVE	2.3		0		5.1	0.5		0		4.8	1.6		0		5.2
3200 - 5480 - BROADWAY @ SHEAFE ST	1.6		0		6.7	0		0.3		4.5	0.7		0.1		5.8
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0.5		0		7.2	0.8		0		5.3	0.7		0		6.5
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		7.2	1.5		0		6.8	0.7		0		7.2
4400 - 5483 - BROADWAY @ SHUTE ST	1.6		0		8.8	2.3		0		9.1	3.8		0		11
4800 - 5484 - BROADWAY @ CAMERON ST	2.7		0		11.5	1		0		10.1	2.2		0		13.2
5200 - 5485 - BROADWAY @ KENWOOD RD	2.3		0		13.8	0.8		0		10.9	2.6		0		15.8
5600 - 5486 - BROADWAY @ EDITH AVE	1.6		0		15.4	0.3		0		11.2	1.3		0		17.1
6000 - 5487 - BROADWAY @ MARIE AVE	0.5		0		15.9	2.5		0		13.7	0.2		0		17.3
6400 - 5488 - BROADWAY @ FERRY ST	2.8		0.3		18.4	2.5		0.3		15.9	2.2		0.1		19.4
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.2		0.2		19.4	0.8		0		16.7	0.4		0		19.8
7200 - 5490 - BROADWAY @ RAYMOND ST	1.9		0.1		21.2	4.8		0.3		21.2	2.9		0		22.7
7600 - 5492 - BROADWAY @ HANCOCK ST	5.3		0		26.5	4		0		25.2	2.6		0.2		25.1
8000 - 5493 - BROADWAY @ PLEASANT ST	0.2		0.1		26.6	0		0.3		24.9	1.2		0.6		25.7
8400 - 5494 - BROADWAY @ WEBSTER ST	0.5		0.1		27	0.8		0		25.7	0.3		0.1		25.9
8800 - 5495 - BROADWAY @ CHURCH ST	0.5		0		27.5	0		0		25.7	0.2		0		26.1
9200 - 5496 - BROADWAY @ NORWOOD ST	5.4		0.7		32.2	2		0.8		26.9	2.1		0.7		27.5
9600 - 5559 - BROADWAY OPP SECOND ST	1.2		0.2		33.2	0.5		0		27.4	0.3		0.2		27.6
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.2		0.4		34	1		0		28.4	0.4		0		28
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.2		0.1		34.1	0.5		0.3		28.6	0.4		0.1		28.3
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.5		0.5		34.1	0.8		0.3		29.1	0.3		0		28.6
11200 - 5499 - BROADWAY OPP THORNDIKE ST	1.3		0		35.4	0.5		0		29.6	1.1		0.3		29.4
11600 - 5500 - BROADWAY @ HORIZON WAY	0.2		0		35.6	0		0		29.6	0		0.1		29.3
12000 - 5501 - OPP 173 ALFORD ST	0.1		0	0	35.7	0		0	0	29.6	0		0	0	29.3
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		35.7	0		0		29.6	0		0		29.3
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0.1		35.6	0.3		0.3		29.6	0		0		29.3
13200 - 5502 - ALFORD ST @ WEST ST	0		0.2		35.4	0		0		29.6	0		0.1		29.2
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.				.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		35.7		-0.3	0		29.5		0.1	0		29.6		-0.4
Maximum					35.7					29.6					29.4
Total	38.1		38.6			32		32			31.8		32.2		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	06:21 (109.0) [5] !Fall 2012!					06:34 (109.0) [3] !Fall 2012!					06:48 (109.0) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	4.6	0	0		4.6	1	0	0		1	4.3	1	0		5.3
800 - 5473 - EASTERN AVE @ LYNN ST	0.2		0		4.8	0		0		1	0.5		0		5.8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.6		0		5.4	0		0		1	0.4		0		6.2
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.4		0		5.8	0		0		1	0.9		0		7.1
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		5.8	0.3		0		1.3	0.2		0		7.3
2400 - 5477 - 1236 EASTERN AVE	0		0		5.8	0		0		1.3	0		0		7.3
2800 - 5478 - BROADWAY @ EASTERN AVE	1.2		0		7	0		0		1.3	1		0.2		8.1
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		7	0.3		0		1.6	0.3		0.2		8.2
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2		0		9	2.3		0		3.9	0.8		0		9
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.4		0		9.4	0.7		0		4.6	0.5		0		9.5
4400 - 5483 - BROADWAY @ SHUTE ST	0.6		0		10	0.3		0		4.9	2.4		0		11.9
4800 - 5484 - BROADWAY @ CAMERON ST	1.2		0		11.2	4		0		8.9	2.3		0		14.2
5200 - 5485 - BROADWAY @ KENWOOD RD	0.8		0		12	1		0		9.9	1.4		0.1		15.5
5600 - 5486 - BROADWAY @ EDITH AVE	0.4		0		12.4	2.3		0		12.2	1		0.2		16.3
6000 - 5487 - BROADWAY @ MARIE AVE	0.2		0.4		12.2	0		0		12.2	0.3		0.2		16.4
6400 - 5488 - BROADWAY @ FERRY ST	3		0		15.2	1		0		13.2	5.6		0.8		21.2
6800 - 5489 - BROADWAY @ WAVERLY AVE	2.4		0		17.6	1.3		0		14.5	2.2		0		23.4
7200 - 5490 - BROADWAY @ RAYMOND ST	4.6		0		22.2	1.3		0		15.8	3.4		0		26.8
7600 - 5492 - BROADWAY @ HANCOCK ST	2.4		0.4		24.2	1		0		16.8	3.7		0.2		30.3
8000 - 5493 - BROADWAY @ PLEASANT ST	1.6		0.2		25.6	0.3		0		17.1	0.6		0.5		30.4
8400 - 5494 - BROADWAY @ WEBSTER ST	2.4		0		28	0.3		0		17.4	1		0.7		30.7
8800 - 5495 - BROADWAY @ CHURCH ST	0.8		0		28.8	0		0		17.4	0.5		0		31.2
9200 - 5496 - BROADWAY @ NORWOOD ST	3.2		0.2		31.8	0		1.7		15.7	2.2		2.9		30.5
9600 - 5559 - BROADWAY OPP SECOND ST	1		0.2		32.6	0.3		0		16	0.8		0.4		30.9
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.2		0.2		33.6	1		0.3		16.7	2.1		0.9		32.1
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.8		1.2		33.2	0		0		16.7	1.1		0.2		33
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.6		0		33.8	0.3		0		17	1.2		0.5		33.7
11200 - 5499 - BROADWAY OPP THORNDIKE ST	1.2		0		35	1		0		18	2.8		0		36.5
11600 - 5500 - BROADWAY @ HORIZON WAY	0.4		0		35.4	0		0		18	0.9		0.1		37.3
12000 - 5501 - OPP 173 ALFORD ST	0		0	0	35.4	0		0	0	18	0		0	1	36.3
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		35.4	0		0		18	0		0		36.3
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		35.4	0		0		18	0		0		36.3
13200 - 5502 - ALFORD ST @ WEST ST	0		0.8		34.6	0		0		18	0		0.2		36.1
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		36		-1.4	0		18.3		-0.3	0		36.2		-0.1
Maximum					35.4					18					37.3
Total	38.2		39.6			20.3		20.3			44.4		44.5		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	07:02 (109.0) [8] !Fall 2012!					07:16 (109.0) [1] !Fall 2012!					07:30 (109.0) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	6.9	1	0		7.9	5	1	0		6	0	0	0		0
800 - 5473 - EASTERN AVE @ LYNN ST	1.5		0		9.4	2		0		8	0		0		0
1200 - 5474 - EASTERN AVE @ CLAPP ST	2.6		0		12	0		0		8	0		0		0
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.6		0		12.6	5		0		13	0		0		0
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		12.6	0		0		13	0		0		0
2400 - 5477 - 1236 EASTERN AVE	0		0		12.6	0		0		13	0		0		0
2800 - 5478 - BROADWAY @ EASTERN AVE	3.1		0.1		15.6	4		0		17	0		0		0
3200 - 5480 - BROADWAY @ SHEAFE ST	1		0		16.6	0		0		17	2		0		2
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2.9		0		19.5	3		0		20	0		0		2
4000 - 5482 - 990 BROADWAY OPP GROVER ST	2.6		0.3		21.8	0		0		20	0		0		2
4400 - 5483 - BROADWAY @ SHUTE ST	1.1		0		22.9	3		0		23	1		0		3
4800 - 5484 - BROADWAY @ CAMERON ST	3.5		0.1		26.3	4		3		24	0		0		3
5200 - 5485 - BROADWAY @ KENWOOD RD	5.6		0		31.9	3		0		27	1		0		4
5600 - 5486 - BROADWAY @ EDITH AVE	1.4		0.3		33	1		1		27	0		0		4
6000 - 5487 - BROADWAY @ MARIE AVE	0.9		0.3		33.6	1		1		27	0		0		4
6400 - 5488 - BROADWAY @ FERRY ST	2.8		4.4		32	8		6		29	3		0		7
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.4		0		33.4	0		0		29	0		0		7
7200 - 5490 - BROADWAY @ RAYMOND ST	2.6		1		35	0		0		29	1		0		8
7600 - 5492 - BROADWAY @ HANCOCK ST	2		0.9		36.1	1		2		28	0		0		8
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		4.8		31.8	0		0		28	0		0		8
8400 - 5494 - BROADWAY @ WEBSTER ST	1.5		0.3		33	0		0		28	0		0		8
8800 - 5495 - BROADWAY @ CHURCH ST	0.1		0		33.1	0		1		27	0		0		8
9200 - 5496 - BROADWAY @ NORWOOD ST	1		1.5		32.6	3		1		29	0		0		8
9600 - 5559 - BROADWAY OPP SECOND ST	0.4		0.3		32.7	0		0		29	4		0		12
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.3		6.1		27.9	5		2		32	0		2		10
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0.1		28.1	0		0		32	0		0		10
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0.5		27.6	0		0		32	0		0		10
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.3		0		27.9	0		2		30	0		2		8
11600 - 5500 - BROADWAY @ HORIZON WAY	0.1		0		28	0		0		30	0		0		8
12000 - 5501 - OPP 173 ALFORD ST	0		0	1	27	0		0	1	29	0		0	0	8
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		27	0		0		29	0		0		8
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0.3		26.7	0		0		29	0		0		8
13200 - 5502 - ALFORD ST @ WEST ST	0		0.5		26.2	0		1		28	0		0		8
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		26.6		-0.4	0		28		0	0		8		0
Maximum					36.1					32					12
Total	47.9		48.1			48		48			12		12		

Massachusetts Bay Transportation Authority
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	07:41 (109.1) [9] !Fall 2012!					07:44 (109.0) [9] !Fall 2012!					07:59 (109.0) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	.	0	.		#VALUE!	4.3	0	0		4.3	0.7	0	0		0.7
800 - 5473 - EASTERN AVE @ LYNN ST	.		.		#VALUE!	0.2		0		4.5	0		0		0.7
1200 - 5474 - EASTERN AVE @ CLAPP ST	.		.		#VALUE!	0.3		0		4.8	0		0		0.7
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	.		.		#VALUE!	0		0		4.8	0		0		0.7
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	.		.		#VALUE!	0		0		4.8	0		0		0.7
2400 - 5477 - 1236 EASTERN AVE	.		.		#VALUE!	0		0		4.8	0		0		0.7
2800 - 5478 - BROADWAY @ EASTERN AVE	.		.		#VALUE!	0.8		0		5.6	0		0		0.7
3200 - 5480 - BROADWAY @ SHEAFE ST	.		.		#VALUE!	2.2		0		7.8	0.3		0		1
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	.		.		#VALUE!	1.9		0.1		9.6	1		0		2
4000 - 5482 - 990 BROADWAY OPP GROVER ST	.		.		#VALUE!	1.1		0		10.7	0.3		0		2.3
4400 - 5483 - BROADWAY @ SHUTE ST	.		.		#VALUE!	1		0		11.7	0		0		2.3
4800 - 5484 - BROADWAY @ CAMERON ST	.		.		#VALUE!	2.3		0.1		13.9	0.7		0		3
5200 - 5485 - BROADWAY @ KENWOOD RD	.		.		#VALUE!	0.2		0		14.1	0		0		3
5600 - 5486 - BROADWAY @ EDITH AVE	.		.		#VALUE!	0.6		0.3		14.4	0.3		0		3.3
6000 - 5487 - BROADWAY @ MARIE AVE	.		.		#VALUE!	0.1		0.4		14.1	0		0		3.3
6400 - 5488 - BROADWAY @ FERRY ST	0.2		0		0.2	1.9		0.9		15.1	0.7		0		4
6800 - 5489 - BROADWAY @ WAVERLY AVE	0.1		0.9		-0.6	1		0		16.1	0.3		0		4.3
7200 - 5490 - BROADWAY @ RAYMOND ST	1.4		0		0.8	1.4		0.2		17.3	0.3		0		4.6
7600 - 5492 - BROADWAY @ HANCOCK ST	2.4		0		3.2	1.7		0.3		18.7	2.7		0		7.3
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		3.2	0.6		0.2		19.1	0		0		7.3
8400 - 5494 - BROADWAY @ WEBSTER ST	1.3		0		4.5	0.2		0.6		18.7	1		0		8.3
8800 - 5495 - BROADWAY @ CHURCH ST	0.1		0		4.6	0.2		0		18.9	0		0		8.3
9200 - 5496 - BROADWAY @ NORWOOD ST	0.3		0.7		4.2	1.6		1.7		18.8	4		1		11.3
9600 - 5559 - BROADWAY OPP SECOND ST	0.8		0.1		4.9	0.6		0.3		19.1	0.7		0		12
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.3		0.9		5.3	0.8		0.4		19.5	0.3		0		12.3
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0.1		5.5	0.3		0.2		19.6	0.3		0		12.6
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0		5.8	0.1		0.1		19.6	0		0		12.6
11200 - 5499 - BROADWAY OPP THORNDIKE ST	1.1		0		6.9	1.1		0		20.7	1.3		0		13.9
11600 - 5500 - BROADWAY @ HORIZON WAY	0.2		0		7.1	0.1		0		20.8	0.3		0		14.2
12000 - 5501 - OPP 173 ALFORD ST	0		0	0	7.1	0		0	0	20.8	0		0	0	14.2
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		7.1	0		0		20.8	0		0		14.2
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		7.1	0		0		20.8	0		0		14.2
13200 - 5502 - ALFORD ST @ WEST ST	0		0		7.1	0		0.7		20.1	0		0.3		13.9
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	0		0		8.1	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		7.1		1	0		20		0.1	0		14		-0.1
Maximum					8.1					20.8					14.2
Total	10		9.8			26.7		26.7			15.3		15.3		

Massachusetts Bay Transportation Authority
Route 109
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Seq - StopID - Stop Name	08:13 (109.0) [4] !Fall 2012!					08:28 (109.0) [13] !Fall 2012!					08:42 (109.0) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	1.5	0	0		1.5	2	1	0		3	0	0	0		0
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		1.5	0		0		3	0		0		0
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		1.5	0.2		0		3.2	0		0		0
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		1.5	0.8		0		4	0		0		0
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		1.5	0		0		4	0		0		0
2400 - 5477 - 1236 EASTERN AVE	0		0		1.5	0		0		4	0		0		0
2800 - 5478 - BROADWAY @ EASTERN AVE	0.5		1		1	0.5		0.1		4.4	0		0		0
3200 - 5480 - BROADWAY @ SHEAFE ST	1		0		2	0		0		4.4	0		0		0
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	1.3		0		3.3	1.5		0.2		5.7	0		0		0
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		3.3	0.3		0		6	1		0		1
4400 - 5483 - BROADWAY @ SHUTE ST	0.5		0		3.8	0.5		0		6.5	0		0		1
4800 - 5484 - BROADWAY @ CAMERON ST	2.8		0		6.6	1		0		7.5	2		0		3
5200 - 5485 - BROADWAY @ KENWOOD RD	0.3		0		6.9	1.4		0		8.9	0		0		3
5600 - 5486 - BROADWAY @ EDITH AVE	0.5		0		7.4	0.2		0		9.1	0		0		3
6000 - 5487 - BROADWAY @ MARIE AVE	0		1		6.4	0.2		0		9.3	0		3		0
6400 - 5488 - BROADWAY @ FERRY ST	0.8		2.3		4.9	2.5		0.2		11.6	2		0		2
6800 - 5489 - BROADWAY @ WAVERLY AVE	0.5		0		5.4	0.8		0.1		12.3	0		0		2
7200 - 5490 - BROADWAY @ RAYMOND ST	0.5		1.5		4.4	2.2		0.1		14.4	0		0		2
7600 - 5492 - BROADWAY @ HANCOCK ST	1		3.5		1.9	1.1		0.2		15.3	3		0		5
8000 - 5493 - BROADWAY @ PLEASANT ST	0.8		0		2.7	0.5		0		15.8	0		0		5
8400 - 5494 - BROADWAY @ WEBSTER ST	1		0		3.7	0.2		0		16	0		0		5
8800 - 5495 - BROADWAY @ CHURCH ST	0		1		2.7	0.2		0.1		16.1	0		0		5
9200 - 5496 - BROADWAY @ NORWOOD ST	1.5		2.8		1.4	2.5		2.5		16.1	1		0		6
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		1.4	0.3		0.2		16.2	0		3		3
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.3		0		1.7	0.8		0.1		16.9	0		0		3
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		1.7	0.1		0		17	0		0		3
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0		2	0.2		0.2		17	0		5		-2
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.3		0		2.3	0.5		0.1		17.4	0		0		-2
11600 - 5500 - BROADWAY @ HORIZON WAY	0.3		0		2.6	0.1		0.1		17.4	0		0		-2
12000 - 5501 - OPP 173 ALFORD ST	0		0	0	2.6	0		0.1	1	16.3	0		0	0	-2
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		2.6	0		0		16.3	0		0		-2
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		2.6	0		0		16.3	0		0		-2
13200 - 5502 - ALFORD ST @ WEST ST	0		2		0.6	0		0.2		16.1	0		0		-2
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0		0.6	0		16.6		-0.5	0		0		-2
Maximum					7.4					17.4					6
Total	15.3		15			20.7		20.9			9		11		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
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Seq - StopID - Stop Name	08:58 (109.0) [8] !Fall 2012!					09:15 (109.0) [11] !Fall 2012!					09:45 (109.0) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	1.6	1	0		2.6	0.8	2	0		2.8	5	2	0		7
800 - 5473 - EASTERN AVE @ LYNN ST	0.1		0		2.7	0.6		0		3.4	0.4		0		7.4
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.4		0		3.1	0		0		3.4	0.1		0		7.5
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		3.1	0.5		0		3.9	0		0		7.5
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		3.1	0.6		0		4.5	0.3		0		7.8
2400 - 5477 - 1236 EASTERN AVE	0		0		3.1	0		0		4.5	0		0		7.8
2800 - 5478 - BROADWAY @ EASTERN AVE	1.1		0		4.2	0.8		0.1		5.2	1.3		0.4		8.7
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		4.2	0		0		5.2	0.1		0		8.8
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2		1.6		4.6	1.3		0		6.5	1.6		0.4		10
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.1		0		4.7	0		0		6.5	0.8		0		10.8
4400 - 5483 - BROADWAY @ SHUTE ST	0.4		0		5.1	0.3		0		6.8	0.8		0		11.6
4800 - 5484 - BROADWAY @ CAMERON ST	1.1		0		6.2	1.7		0		8.5	2.1		0		13.7
5200 - 5485 - BROADWAY @ KENWOOD RD	1		0		7.2	0.4		0		8.9	1.8		0.4		15.1
5600 - 5486 - BROADWAY @ EDITH AVE	0.3		0.6		6.9	0.7		0		9.6	0.8		0		15.9
6000 - 5487 - BROADWAY @ MARIE AVE	0.4		0		7.3	0		0.1		9.5	0.6		0.1		16.4
6400 - 5488 - BROADWAY @ FERRY ST	7.4		2.3		12.4	2.8		0.5		11.8	3.6		1		19
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.5		0		13.9	1.1		0		12.9	2		0		21
7200 - 5490 - BROADWAY @ RAYMOND ST	2.4		0		16.3	2		0.4		14.5	2		0.1		22.9
7600 - 5492 - BROADWAY @ HANCOCK ST	2.4		1.5		17.2	1.5		0.1		15.9	1.8		0		24.7
8000 - 5493 - BROADWAY @ PLEASANT ST	1.4		1.9		16.7	1		0		16.9	1.3		0.3		25.7
8400 - 5494 - BROADWAY @ WEBSTER ST	0.6		0.8		16.5	0.5		0		17.4	0.3		0.1		25.9
8800 - 5495 - BROADWAY @ CHURCH ST	0.4		3.8		13.1	0.4		0.4		17.4	1		0.8		26.1
9200 - 5496 - BROADWAY @ NORWOOD ST	2.6		8.8		6.9	4.8		1.3		20.9	3.1		2.8		26.4
9600 - 5559 - BROADWAY OPP SECOND ST	1		1.1		6.8	0.5		0.5		20.9	1.9		0.5		27.8
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.6		2.1		6.3	1.1		0.3		21.7	0.8		0.1		28.5
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.9		0		7.2	0.5		0.2		22	0.8		0.1		29.2
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.1		3.3		4	0.3		0.1		22.2	0.8		1		29
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.3		0		4.3	1.1		0.3		23	0.6		0		29.6
11600 - 5500 - BROADWAY @ HORIZON WAY	0.4		1.9		2.8	0.1		0		23.1	0.1		0		29.7
12000 - 5501 - OPP 173 ALFORD ST	0		1	1	0.8	0		0	2	21.1	0		0	2	27.7
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		0.8	0		0		21.1	0		0		27.7
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		0.8	0		0		21.1	0		0		27.7
13200 - 5502 - ALFORD ST @ WEST ST	0		0.8		-6E-15	0		0.4		20.7	0		0		27.7
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0.5		-0.5	0		21.4		-0.7	0		27.4		0.3
Maximum					17.2					23.1					29.7
Total	31.4		31.8			25.3		25.8			35.4		35.4		

Massachusetts Bay Transportation Authority
Route 109
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	Trip (RouteVar) [Observations]														
	14:15 (109.0) [6] !Fall 2012!					14:30 (109.0) [23] !Fall 2012!					14:35 (109.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	7	3	0		10	3	2	0		5	2.3	2	0		4.3
800 - 5473 - EASTERN AVE @ LYNN ST	0.2		0		10.2	0		0		5	0		0		4.3
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.3		0		10.5	0		0		5	0		0		4.3
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.7		0		11.2	0		0.1		4.9	0		0		4.3
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0.3		0		11.5	0		0		4.9	0		0		4.3
2400 - 5477 - 1236 EASTERN AVE	0		0		11.5	0		0		4.9	0		0		4.3
2800 - 5478 - BROADWAY @ EASTERN AVE	0.8		0		12.3	1		0.3		5.6	2.5		0		6.8
3200 - 5480 - BROADWAY @ SHEAFE ST	0.2		0.2		12.3	0.1		0		5.7	0.5		0		7.3
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	3.5		1		14.8	1.4		0.1		7	4		1		10.3
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.8		0.3		15.3	0.4		1.2		6.2	0		0		10.3
4400 - 5483 - BROADWAY @ SHUTE ST	1.5		0		16.8	0.1		0		6.3	0.5		0		10.8
4800 - 5484 - BROADWAY @ CAMERON ST	3.5		0.2		20.1	6.4		0		12.7	1		0		11.8
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0.2		20.4	0.1		0		12.8	1.5		0.5		12.8
5600 - 5486 - BROADWAY @ EDITH AVE	0.7		0.3		20.8	0.3		0		13.1	0		0		12.8
6000 - 5487 - BROADWAY @ MARIE AVE	1.3		0.5		21.6	0.7		0.3		13.5	0		0		12.8
6400 - 5488 - BROADWAY @ FERRY ST	13.2		1.2		33.6	8.4		2		19.9	8		0.5		20.3
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.3		0		34.9	0.8		0		20.7	0		0		20.3
7200 - 5490 - BROADWAY @ RAYMOND ST	4.7		1		38.6	1.7		0.9		21.5	1		0.5		20.8
7600 - 5492 - BROADWAY @ HANCOCK ST	4.3		0.7		42.2	0.9		0.5		21.9	1.5		1.5		20.8
8000 - 5493 - BROADWAY @ PLEASANT ST	0.7		0.8		42.1	0.5		0.8		21.6	0.5		0		21.3
8400 - 5494 - BROADWAY @ WEBSTER ST	0.2		0.3		42	0.6		1.3		20.9	0		2		19.3
8800 - 5495 - BROADWAY @ CHURCH ST	0.3		1.3		41	0.7		3.3		18.3	0		0		19.3
9200 - 5496 - BROADWAY @ NORWOOD ST	3.8		5.2		39.6	3		7.4		13.9	3		2		20.3
9600 - 5559 - BROADWAY OPP SECOND ST	1.8		1.5		39.9	0.7		1.1		13.5	1.5		0.5		21.3
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.2		2		39.1	0.9		4.6		9.8	1.5		0.5		22.3
10400 - 5497 - BROADWAY @ BOWDOIN ST	1.5		0.5		40.1	0.4		1.3		8.9	0		0		22.3
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.7		39.7	0.5		1.9		7.5	0		0		22.3
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.5		2.5		37.7	0.3		1.4		6.4	0.5		0.5		22.3
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		37.7	0.2		0.5		6.1	0.5		0		22.8
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	34.7	0		0	2	4.1	0		0	2	20.8
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		34.7	0		0		4.1	0		0		20.8
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		34.7	0		0.9		3.2	0		0		20.8
13200 - 5502 - ALFORD ST @ WEST ST	0		0.2		34.5	0		0.2		3	0		0		20.8
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		34.7		-0.2	0		2.7		0.3	0		19		1.8
Maximum					42.2					21.9					22.8
Total	55.2		55.2			33.3		33			30.3		28.5		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
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Seq - StopID - Stop Name	14:55 (109.0) [7] !Fall 2012!					15:15 (109.0) [1] !Fall 2012!					15:35 (109.0) [6] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	3.6	3	0		6.6	2	3	0		5	3.5	4	0		7.5
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		6.6	0		0		5	0.3		0		7.8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.4		0		7	0		0		5	0		0		7.8
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.7		0		7.7	0		0		5	0.3		0		8.1
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		7.7	0		0		5	0.2		0		8.3
2400 - 5477 - 1236 EASTERN AVE	0		0		7.7	0		0		5	0		0		8.3
2800 - 5478 - BROADWAY @ EASTERN AVE	1.6		0.4		8.9	1		0		6	0.3		0		8.6
3200 - 5480 - BROADWAY @ SHEAFE ST	0.3		0		9.2	0		0		6	0.5		0.3		8.8
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	7.4		0.3		16.3	2		0		8	2.3		0.5		10.6
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0.3		16	0		0		8	0		0		10.6
4400 - 5483 - BROADWAY @ SHUTE ST	0.6		0.1		16.5	0		0		8	1		0		11.6
4800 - 5484 - BROADWAY @ CAMERON ST	9.3		0.3		25.5	0		0		8	0.7		0.5		11.8
5200 - 5485 - BROADWAY @ KENWOOD RD	0.3		0.7		25.1	0		0		8	0		0		11.8
5600 - 5486 - BROADWAY @ EDITH AVE	0.1		0.3		24.9	0		0		8	0		0		11.8
6000 - 5487 - BROADWAY @ MARIE AVE	0.4		0.1		25.2	0		0		8	0		1		10.8
6400 - 5488 - BROADWAY @ FERRY ST	4.6		0.7		29.1	2		1		9	3.3		0.5		13.6
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.4		0.3		30.2	0		0		9	1.7		0.2		15.1
7200 - 5490 - BROADWAY @ RAYMOND ST	2.4		0.7		31.9	0		0		9	1		0.3		15.8
7600 - 5492 - BROADWAY @ HANCOCK ST	1.1		0.9		32.1	0		0		9	1.5		0		17.3
8000 - 5493 - BROADWAY @ PLEASANT ST	0.7		1.3		31.5	1		0		10	0		0		17.3
8400 - 5494 - BROADWAY @ WEBSTER ST	0.4		0.7		31.2	0		1		9	0.7		0.2		17.8
8800 - 5495 - BROADWAY @ CHURCH ST	0.7		1.1		30.8	0		0		9	0.2		0.3		17.7
9200 - 5496 - BROADWAY @ NORWOOD ST	2.7		3		30.5	0		4		5	3		1.2		19.5
9600 - 5559 - BROADWAY OPP SECOND ST	0.6		0.3		30.8	0		0		5	0.8		0.3		20
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.7		0.6		30.9	0		0		5	0.5		0		20.5
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0.4		30.5	0		1		4	0.5		0		21
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.7		0.3		30.9	0		0		4	0.3		0		21.3
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.1		0.7		30.3	0		0		4	0.2		0.5		21
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		30.3	0		0		4	0.2		0.2		21
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	27.3	0		0	3	1	0		0	4	17
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		27.3	0		0		1	0		0		17
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		27.3	0		0		1	0		0		17
13200 - 5502 - ALFORD ST @ WEST ST	0		0		27.3	0		0		1	0		0.2		16.8
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		27.7		-0.4	0		1		0	0		16.8		-3.6E-15
Maximum					32.1					10					21.3
Total	41		41.3			8		8			23		23		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	15:55 (109.0) [2] !Fall 2012!					16:15 (109.0) [7] !Fall 2012!					16:30 (109.0) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	0	3	0		3	7.1	0	0		7.1	6	0	0		6
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		3	0.3		0		7.4	2		0		8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		3	0.1		0		7.5	0		0		8
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		3	0		0		7.5	0		0		8
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		3	0		0		7.5	0		0		8
2400 - 5477 - 1236 EASTERN AVE	0		0		3	0		0		7.5	0		0		8
2800 - 5478 - BROADWAY @ EASTERN AVE	2		0		5	0.7		0		8.2	0		0		8
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		5	0.6		0.1		8.7	0		0		8
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	4.5		0		9.5	3.9		0.1		12.5	1		0		9
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.5		0.5		9.5	0.1		0		12.6	2		0		11
4400 - 5483 - BROADWAY @ SHUTE ST	0.5		0		10	0.1		0		12.7	6		0		17
4800 - 5484 - BROADWAY @ CAMERON ST	3.5		0		13.5	2.7		0.3		15.1	2		0		19
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0		14	0		0.3		14.8	0		0		19
5600 - 5486 - BROADWAY @ EDITH AVE	0.5		0		14.5	0		0.7		14.1	0		0		19
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		14.5	0.3		0.9		13.5	0		0		19
6400 - 5488 - BROADWAY @ FERRY ST	2		1		15.5	2.4		1.6		14.3	1		2		18
6800 - 5489 - BROADWAY @ WAVERLY AVE	2		0		17.5	0.1		0.3		14.1	0		0		18
7200 - 5490 - BROADWAY @ RAYMOND ST	0		1		16.5	1.7		0.1		15.7	0		0		18
7600 - 5492 - BROADWAY @ HANCOCK ST	0.5		0.5		16.5	0.4		0.6		15.5	1		2		17
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		1		16	0.3		0		15.8	2		0		19
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		16	0		0.6		15.2	1		0		20
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		16	0		0.6		14.6	0		5		15
9200 - 5496 - BROADWAY @ NORWOOD ST	2		1.5		16.5	2.9		1.6		15.9	1		0		16
9600 - 5559 - BROADWAY OPP SECOND ST	0.5		0		17	0.7		0.3		16.3	3		0		19
10000 - 5560 - BROADWAY @ GLADSTONE ST	2		0		19	0.7		0.1		16.9	0		1		18
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		19	0.7		0		17.6	0		0		18
10800 - 5498 - BROADWAY OPP BEACHAM ST	2.5		0.5		21	0.7		0.3		18	0		0		18
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		21	0		0		18	1		1		18
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		21	0.1		0.3		17.8	0		0		18
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	18	0		0	0	17.8	0		0	0	18
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		18	0		0		17.8	0		0		18
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		18	0.1		0.1		17.8	0		0		18
13200 - 5502 - ALFORD ST @ WEST ST	0		0		18	0		0		17.8	0		0		18
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		18		0	0		18.1		-0.3	0		18		0
Maximum					21					18					20
Total	24		24			27		27			29		29		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	16:45 (109.0) [1] !Fall 2012!					17:00 (109.0) [11] !Fall 2012!					17:15 (109.0) [2] !Spring 2013!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	12	0	0		12	4.2	0	0		4.2	3	0	0		3
800 - 5473 - EASTERN AVE @ LYNN ST	1		0		13	0.1		0		4.3	0		0		3
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		13	0		0		4.3	0		0		3
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		13	0.2		0		4.5	0		0		3
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	2		0		15	0		0		4.5	0		0		3
2400 - 5477 - 1236 EASTERN AVE	0		0		15	0		0		4.5	0		0		3
2800 - 5478 - BROADWAY @ EASTERN AVE	0		0		15	0.6		0		5.1	1		0.5		3.5
3200 - 5480 - BROADWAY @ SHEAFE ST	1		1		15	0.3		0.2		5.2	0		0		3.5
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	8		0		23	2.2		0.2		7.2	4.5		0		8
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		23	0.1		0		7.3	0		0		8
4400 - 5483 - BROADWAY @ SHUTE ST	1		0		24	0.4		0		7.7	0		0.5		7.5
4800 - 5484 - BROADWAY @ CAMERON ST	4		1		27	1.3		0		9	1.5		0		9
5200 - 5485 - BROADWAY @ KENWOOD RD	2		0		29	0.2		0.1		9.1	0.5		0		9.5
5600 - 5486 - BROADWAY @ EDITH AVE	0		1		28	0.3		0.4		9	0		0		9.5
6000 - 5487 - BROADWAY @ MARIE AVE	0		5		23	0.5		0.4		9.1	0		0		9.5
6400 - 5488 - BROADWAY @ FERRY ST	3		5		21	1.9		0.8		10.2	1		1.5		9
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		21	0.5		0.2		10.5	0		0		9
7200 - 5490 - BROADWAY @ RAYMOND ST	1		2		20	1.2		1		10.7	0.5		0		9.5
7600 - 5492 - BROADWAY @ HANCOCK ST	1		0		21	1.8		0.2		12.3	2		1		10.5
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		21	0.4		0.1		12.6	0		0		10.5
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		21	0.4		0.1		12.9	0		0		10.5
8800 - 5495 - BROADWAY @ CHURCH ST	0		1		20	0.5		0.2		13.2	0		0		10.5
9200 - 5496 - BROADWAY @ NORWOOD ST	3		3		20	2.5		0.8		14.9	3.5		0.5		13.5
9600 - 5559 - BROADWAY OPP SECOND ST	0		1		19	0.7		0.7		14.9	1		2.5		12
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		0		19	0.5		0.3		15.1	1.5		0.5		13
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		19	0.3		0		15.4	0.5		0		13.5
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		19	0.2		0.2		15.4	0		0		13.5
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		19	0.5		0.4		15.5	0.5		1		13
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		19	0.5		0		16	0		0		13
12000 - 5501 - OPP 173 ALFORD ST	0		0	0	19	0		0	0	16	0		0	0	13
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		19	0		0		16	0		0		13
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		19	0		0.1		15.9	0		0		13
13200 - 5502 - ALFORD ST @ WEST ST	0		0		19	0		0.1		15.8	0		0.5		12.5
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		19		0	0		15.9		-0.1	0		12.5		0
Maximum					29					16					13.5
Total	39		39			21.9		22.2			21		21		

Massachusetts Bay Transportation Authority
Route 109
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(Urban Transportation Associates)

	17:30 (109.0) [1] !Fall 2012!					17:45 (109.0) [8] !Fall 2012!					18:00 (109.0) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	8	0	0		8	1.6	0	0		1.6	3.1	2	0		5.1
800 - 5473 - EASTERN AVE @ LYNN ST	1		0		9	0		0		1.6	0.2		0		5.3
1200 - 5474 - EASTERN AVE @ CLAPP ST	1		0		10	0		0		1.6	0.2		0		5.5
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		10	0.3		0		1.9	0.1		0		5.6
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		10	0		0		1.9	0		0		5.6
2400 - 5477 - 1236 EASTERN AVE	0		0		10	0		0		1.9	0		0		5.6
2800 - 5478 - BROADWAY @ EASTERN AVE	1		0		11	0.5		0		2.4	0.8		0		6.4
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		11	0		0		2.4	0		0		6.4
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0		0		11	1		0.1		3.3	2.4		0.3		8.5
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		1		10	0		0		3.3	0		0		8.5
4400 - 5483 - BROADWAY @ SHUTE ST	0		1		9	0.3		0		3.6	0.2		0.1		8.6
4800 - 5484 - BROADWAY @ CAMERON ST	0		0		9	0.1		0		3.7	1		0		9.6
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		9	0		0		3.7	0.3		0.6		9.3
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		9	0.3		0		4	0.1		0.4		9
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		9	0		0		4	0.5		0.2		9.3
6400 - 5488 - BROADWAY @ FERRY ST	0		3		6	0.5		0.1		4.4	0.4		1.5		8.2
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		6	0.8		0		5.2	0.3		0.6		7.9
7200 - 5490 - BROADWAY @ RAYMOND ST	0		0		6	0.3		0.3		5.2	1		0.5		8.4
7600 - 5492 - BROADWAY @ HANCOCK ST	0		3		3	0.3		0.1		5.4	0.4		1.2		7.6
8000 - 5493 - BROADWAY @ PLEASANT ST	1		0		4	0.5		0.3		5.6	0.4		0.4		7.6
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		4	0.5		0.4		5.7	0.1		0.8		6.9
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		4	0.6		0.3		6	0.1		0.5		6.5
9200 - 5496 - BROADWAY @ NORWOOD ST	0		0		4	1.5		0.4		7.1	1.2		2		5.7
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		4	0		0		7.1	0.1		0.5		5.3
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		0		4	0.5		0.1		7.5	0.4		1.3		4.4
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		4	0		0.4		7.1	0		0.2		4.2
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		1		3	0.1		0.4		6.8	0.4		0.6		4
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		3	0.4		0.1		7.1	0.4		0.3		4.1
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		3	0		0		7.1	0		0		4.1
12000 - 5501 - OPP 173 ALFORD ST	0		0	0	3	0		0	0	7.1	0		0	2	2.1
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		3	0		0		7.1	0		0		2.1
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		3	0		0		7.1	0		0		2.1
13200 - 5502 - ALFORD ST @ WEST ST	0		0		3	0		0		7.1	0		1.5		0.6
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		3		0	0		7		0.1	0		0		0.6
Maximum					11					7.5					9.6
Total	12		12			9.9		9.9			13.7		13.5		

Massachusetts Bay Transportation Authority
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(Urban Transportation Associates)

	18:15 (109.0) [2] !Spring 2012!					18:30 (109.0) [3] !Fall 2012!					18:45 (109.0) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	3.5	2	0		5.5	2.7	2	0		4.7	3.8	1	0		4.8
800 - 5473 - EASTERN AVE @ LYNN ST	0		0.5		5	0		0		4.7	0		0		4.8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		5	0		0		4.7	0.3		0		5.1
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.5		0		5.5	0		0		4.7	0.1		0		5.2
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		5.5	0		0		4.7	0		0		5.2
2400 - 5477 - 1236 EASTERN AVE	0		0		5.5	0		0		4.7	0		0		5.2
2800 - 5478 - BROADWAY @ EASTERN AVE	0		0		5.5	1.3		0		6	0.4		0		5.6
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		5.5	0		0		6	0.1		0		5.7
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2		0.5		7	2.3		0.3		8	1.7		1		6.4
4000 - 5482 - 990 BROADWAY OPP GROVER ST	3		0		10	0		0.3		7.7	0		0		6.4
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		10	0		0		7.7	0		0		6.4
4800 - 5484 - BROADWAY @ CAMERON ST	0.5		0		10.5	0.7		0		8.4	0.6		0		7
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		10.5	0		0		8.4	0		0		7
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		10.5	0		0		8.4	0.2		0.2		7
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		10.5	2		0.3		10.1	0.2		0.7		6.5
6400 - 5488 - BROADWAY @ FERRY ST	0		1		9.5	0.7		1.3		9.5	1		3		4.5
6800 - 5489 - BROADWAY @ WAVERLY AVE	1.5		1		10	0.3		0		9.8	0.2		0.2		4.5
7200 - 5490 - BROADWAY @ RAYMOND ST	0		0		10	0		0		9.8	0.4		0		4.9
7600 - 5492 - BROADWAY @ HANCOCK ST	0.5		0.5		10	0.7		0.7		9.8	1.3		1.9		4.3
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		10	0		0		9.8	0.3		0.7		3.9
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		10	0.3		0.3		9.8	0.5		0.5		3.9
8800 - 5495 - BROADWAY @ CHURCH ST	0		0.5		9.5	0.7		0.3		10.2	0.1		1.2		2.8
9200 - 5496 - BROADWAY @ NORWOOD ST	0		0		9.5	0.7		1.3		9.6	1.9		2		2.7
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		9.5	0.7		0		10.3	0.2		0.7		2.2
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		0		9.5	0.3		1		9.6	0.5		0.9		1.8
10400 - 5497 - BROADWAY @ BOWDOIN ST	1.5		1.5		9.5	0.7		0		10.3	0.1		0.2		1.7
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		9.5	0		0		10.3	0.2		0		1.9
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		9.5	0.7		0		11	0.5		0.7		1.7
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		9.5	0		0		11	0		0		1.7
12000 - 5501 - OPP 173 ALFORD ST	0		0	2	7.5	0		0	2	9	0		0	1	0.7
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		7.5	0		0		9	0		0		0.7
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		7.5	0		0.7		8.3	0		0		0.7
13200 - 5502 - ALFORD ST @ WEST ST	0		0		7.5	0		0		8.3	0		0		0.7
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		7.5		0	0		8		0.3	0		0.5		0.2
Maximum					10.5					11					7
Total	13		13			14.7		14.7			14.6		14.4		

Massachusetts Bay Transportation Authority
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	19:00 (109.0) [3] !Fall 2012!					19:15 (109.0) [8] !Fall 2012!					19:25 (109.0) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	2.3	2	0		4.3	1.1	2	0		3.1	2.8	2	0		4.8
800 - 5473 - EASTERN AVE @ LYNN ST	0.7		0		5	0		0		3.1	0		0		4.8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		5	0		0		3.1	0		0		4.8
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		5	0.1		0		3.2	0		0.2		4.6
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		5	0		0		3.2	0		0		4.6
2400 - 5477 - 1236 EASTERN AVE	0		0		5	0		0		3.2	0		0		4.6
2800 - 5478 - BROADWAY @ EASTERN AVE	0.3		0		5.3	0		0		3.2	0.2		0		4.8
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		5.3	0.1		0		3.3	0		0		4.8
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0.7		0.7		5.3	2		0		5.3	0.2		0.2		4.8
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		5.3	0		0		5.3	0.2		0		5
4400 - 5483 - BROADWAY @ SHUTE ST	1.3		0		6.6	0.1		0		5.4	0.3		0		5.3
4800 - 5484 - BROADWAY @ CAMERON ST	0		0		6.6	0.5		0		5.9	0		0.3		5
5200 - 5485 - BROADWAY @ KENWOOD RD	0.3		0		6.9	0		0		5.9	0		0.2		4.8
5600 - 5486 - BROADWAY @ EDITH AVE	0		0.3		6.6	0		0		5.9	0.8		0.3		5.3
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		6.6	0.3		0.3		5.9	0.3		0		5.6
6400 - 5488 - BROADWAY @ FERRY ST	0		0.3		6.3	0.8		1.6		5.1	0.5		0.7		5.4
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		6.3	0.1		0.3		4.9	0.2		0.2		5.4
7200 - 5490 - BROADWAY @ RAYMOND ST	0		0		6.3	0.4		0		5.3	0.2		0.2		5.4
7600 - 5492 - BROADWAY @ HANCOCK ST	0.3		0		6.6	0.1		1.1		4.3	0.5		0.8		5.1
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		6.6	0.3		0.1		4.5	0		0.3		4.8
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		6.6	0		1		3.5	0		0.2		4.6
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		6.6	0		0.1		3.4	0		0.2		4.4
9200 - 5496 - BROADWAY @ NORWOOD ST	1		0.3		7.3	0.5		0		3.9	0.7		0.2		4.9
9600 - 5559 - BROADWAY OPP SECOND ST	0		0.3		7	0.3		1.1		3.1	0.3		0		5.2
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.3		0		7.3	0.3		0.3		3.1	0		0		5.2
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		7.3	0.1		0		3.2	0		0.2		5
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		7.3	0.3		0.4		3.1	0		0		5
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		7.3	0		0		3.1	0		0		5
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		7.3	0		0		3.1	0		0		5
12000 - 5501 - OPP 173 ALFORD ST	0		0	2	5.3	0		0	2	1.1	0		0	2	3
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		5.3	0		0		1.1	0		0		3
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		5.3	0		0		1.1	0		0		3
13200 - 5502 - ALFORD ST @ WEST ST	0		0		5.3	0		0		1.1	0		0		3
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		5.7		-0.4	0		1.1		-8.9E-16	0		3.2		-0.2
Maximum					7.3					5.9					5.6
Total	7.3		7.7			7.3		7.4			7.2		7.2		

Massachusetts Bay Transportation Authority

Route 109

Weekday - Inbound

Fall 2012

(Urban Transportation Associates)

	19:45 (109.0) [13] !Fall 2012!					20:10 (109.0) [6] !Fall 2012!					21:10 (109.0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	3.2	3	0		6.2	4.5	6	0		10.5	5.6	8	0		13.6
800 - 5473 - EASTERN AVE @ LYNN ST	0.6		0		6.8	0		0		10.5	0		0		13.6
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.1		0		6.9	0		0		10.5	0		0		13.6
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.1		0		7	0		0		10.5	0		0		13.6
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0.1		0		7.1	0.2		0		10.7	0		0		13.6
2400 - 5477 - 1236 EASTERN AVE	0		0		7.1	0		0		10.7	0		0		13.6
2800 - 5478 - BROADWAY @ EASTERN AVE	0.4		0		7.5	0.7		0.2		11.2	1.3		0.3		14.6
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		7.5	0.2		0		11.4	0.1		0		14.7
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0.7		0		8.2	1.2		0		12.6	3.1		0.1		17.7
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		8.2	0.5		0		13.1	0.4		0		18.1
4400 - 5483 - BROADWAY @ SHUTE ST	0.1		0.1		8.2	0.5		0		13.6	0.1		0		18.2
4800 - 5484 - BROADWAY @ CAMERON ST	0.4		0.1		8.5	0.2		0		13.8	0.6		0		18.8
5200 - 5485 - BROADWAY @ KENWOOD RD	0.2		0		8.7	0.2		0.3		13.7	0		0		18.8
5600 - 5486 - BROADWAY @ EDITH AVE	0		0.3		8.4	0.2		0.3		13.6	1.6		0.8		19.6
6000 - 5487 - BROADWAY @ MARIE AVE	0.1		0.1		8.4	0		0.3		13.3	0.3		0.5		19.4
6400 - 5488 - BROADWAY @ FERRY ST	1.5		0.8		9.1	1.7		1.2		13.8	2.6		1.4		20.6
6800 - 5489 - BROADWAY @ WAVERLY AVE	0.8		0		9.9	0.3		0.5		13.6	1.3		0		21.9
7200 - 5490 - BROADWAY @ RAYMOND ST	0.8		0		10.7	0.7		0		14.3	1.4		0.5		22.8
7600 - 5492 - BROADWAY @ HANCOCK ST	1.5		0.3		11.9	1.2		0.7		14.8	1.6		0.3		24.1
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		0.6		11.8	0		0		14.8	0.4		0.1		24.4
8400 - 5494 - BROADWAY @ WEBSTER ST	0.2		0.1		11.9	0.3		0.2		14.9	0.1		0.4		24.1
8800 - 5495 - BROADWAY @ CHURCH ST	0		0.1		11.8	0		0		14.9	0		0.8		23.3
9200 - 5496 - BROADWAY @ NORWOOD ST	2.3		0.8		13.3	1		0.5		15.4	2		1.3		24
9600 - 5559 - BROADWAY OPP SECOND ST	0.5		0		13.8	0.3		0.3		15.4	0.4		0.1		24.3
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.4		0.3		13.9	1.2		0.3		16.3	0		0.3		24
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.2		0		14.1	0.5		0.2		16.6	0.4		0.1		24.3
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.1		0.1		14.1	0		0		16.6	0.3		0.4		24.2
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.1		0.1		14.1	0.2		0		16.8	0.5		0.3		24.4
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		14.1	0.2		0		17	0		0		24.4
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	11.1	0		0	6	11	0		0	8	16.4
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		11.1	0		0		11	0		0		16.4
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0.1		11	0		0		11	0		0		16.4
13200 - 5502 - ALFORD ST @ WEST ST	0		0		11	0		0		11	0		0.1		16.3
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		10.8		0.2	0		11		-7.1E-15	0		16.5		-0.2
Maximum					14.1					17					24.4
Total	14.6		14.6			15.7		16			24		24		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	22:10 (109.0) [14] !Fall 2012!					23:05 (109.0) [2] !Fall 2012!					24:05 (109.0) [7] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	4	7	0		11	3	6	0		9	1.7	5	0		6.7
800 - 5473 - EASTERN AVE @ LYNN ST	0.1		0		11.1	0		0		9	0		0		6.7
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.1		0		11.2	0		0		9	0		0		6.7
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		11.2	0		0		9	0		0		6.7
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		11.2	0		0		9	0		0		6.7
2400 - 5477 - 1236 EASTERN AVE	0		0		11.2	0		0		9	0		0		6.7
2800 - 5478 - BROADWAY @ EASTERN AVE	1.2		0.3		12.1	1		0		10	0.3		0		7
3200 - 5480 - BROADWAY @ SHEAFE ST	0.1		0		12.2	0		0		10	0.7		0		7.7
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2.5		0		14.7	0.5		0		10.5	0.6		0		8.3
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.1		0.3		14.5	1		0		11.5	0		0		8.3
4400 - 5483 - BROADWAY @ SHUTE ST	0.6		0.3		14.8	0		0		11.5	0		0		8.3
4800 - 5484 - BROADWAY @ CAMERON ST	1.6		0		16.4	0		0		11.5	0		0		8.3
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		16.4	0		0		11.5	0		0		8.3
5600 - 5486 - BROADWAY @ EDITH AVE	0.1		0.3		16.2	0		0		11.5	0		0		8.3
6000 - 5487 - BROADWAY @ MARIE AVE	0.1		1.6		14.7	0		0		11.5	0.3		0		8.6
6400 - 5488 - BROADWAY @ FERRY ST	2.1		4.1		12.7	0		0		11.5	0.9		0.9		8.6
6800 - 5489 - BROADWAY @ WAVERLY AVE	0.9		0		13.6	0.5		0		12	0.1		0		8.7
7200 - 5490 - BROADWAY @ RAYMOND ST	1.7		0.6		14.7	0.5		0		12.5	0		0.4		8.3
7600 - 5492 - BROADWAY @ HANCOCK ST	1.7		1.4		15	1		0		13.5	0.6		0		8.9
8000 - 5493 - BROADWAY @ PLEASANT ST	0.4		3.6		11.8	0		0.5		13	0		0		8.9
8400 - 5494 - BROADWAY @ WEBSTER ST	0.3		0.9		11.2	0		0		13	0.1		0		9
8800 - 5495 - BROADWAY @ CHURCH ST	0		0.4		10.8	0		0		13	0.1		0.1		9
9200 - 5496 - BROADWAY @ NORWOOD ST	2		1.3		11.5	2.5		2		13.5	0.1		0.7		8.4
9600 - 5559 - BROADWAY OPP SECOND ST	0.4		0.5		11.4	0.5		0		14	0.7		0.1		9
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.4		0.8		12	1.5		0		15.5	0		0		9
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.4		2		10.4	0		0		15.5	0.1		0		9.1
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.5		10.2	0		0		15.5	0.1		0.1		9.1
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.4		0.5		10.1	0		0		15.5	0		0		9.1
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		10.1	0.5		0		16	0		0		9.1
12000 - 5501 - OPP 173 ALFORD ST	0		0	7	3.1	0		0	6	10	0		0	5	4.1
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		3.1	0	.	0		10	0		0		4.1
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		3.1	0		0		10	0		0		4.1
13200 - 5502 - ALFORD ST @ WEST ST	0		0.6		2.5	0		0		10	0		0		4.1
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	.		.		.	.		.		.	.		.		.
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		0.9		1.6	0		10.5		-0.5	0		4.1		0
Maximum					16.4					16					9.1
Total	22.3		20.9			12.5		13			6.6		6.6		

Massachusetts Bay Transportation Authority
Route 109
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Fall 2012
(Urban Transportation Associates)

	Total				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load
400 - 7412 - LYNN ST @ BEACH ST	180.4		0		#VALUE!
800 - 5473 - EASTERN AVE @ LYNN ST	15.5		0.7		#VALUE!
1200 - 5474 - EASTERN AVE @ CLAPP ST	9.2		0.3		#VALUE!
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	15.9		0.3		#VALUE!
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	5.7		0		#VALUE!
2400 - 5477 - 1236 EASTERN AVE	0		0		#VALUE!
2800 - 5478 - BROADWAY @ EASTERN AVE	52.1		6.6		#VALUE!
3200 - 5480 - BROADWAY @ SHEAFE ST	16.9		3.7		#VALUE!
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	115.8		11.9		#VALUE!
4000 - 5482 - 990 BROADWAY OPP GROVER ST	25.6		4.4		#VALUE!
4400 - 5483 - BROADWAY @ SHUTE ST	45.2		3.8		#VALUE!
4800 - 5484 - BROADWAY @ CAMERON ST	100.3		8.9		#VALUE!
5200 - 5485 - BROADWAY @ KENWOOD RD	38.6		3.5		#VALUE!
5600 - 5486 - BROADWAY @ EDITH AVE	22.9		9.8		#VALUE!
6000 - 5487 - BROADWAY @ MARIE AVE	17.3		22.2		#VALUE!
6400 - 5488 - BROADWAY @ FERRY ST	144.9		70.7		762.5
6800 - 5489 - BROADWAY @ WAVERLY AVE	57.8		5.5		814.8
7200 - 5490 - BROADWAY @ RAYMOND ST	87.8		17.6		885
7600 - 5492 - BROADWAY @ HANCOCK ST	95.1		34.7		945.4
8000 - 5493 - BROADWAY @ PLEASANT ST	33		24.4		954
8400 - 5494 - BROADWAY @ WEBSTER ST	25.3		16.6		962.7
8800 - 5495 - BROADWAY @ CHURCH ST	13.9		31		945.6
9200 - 5496 - BROADWAY @ NORWOOD ST	151.7		98.5		998.8
9600 - 5559 - BROADWAY OPP SECOND ST	40.7		21.6		1017.9
10000 - 5560 - BROADWAY @ GLADSTONE ST	50.2		37.1		1031
10400 - 5497 - BROADWAY @ BOWDOIN ST	18.9		14.7		1035.2
10800 - 5498 - BROADWAY OPP BEACHAM ST	18.2		21.9		1031.5
11200 - 5499 - BROADWAY OPP THORNDIKE ST	27.4		18.8		1040.1
11600 - 5500 - BROADWAY @ HORIZON WAY	6.3		3.3		1043.1
12000 - 5501 - OPP 173 ALFORD ST	0.3		1.8		939.6
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0.1		0		939.7
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0.4		2.8		937.3
13200 - 5502 - ALFORD ST @ WEST ST	0.1		11.8		925.6
13220 - 2842 - CAMBRIDGE ST @ MAFFA WAY	0		0		69.4
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		931.2		-4.6
Maximum	0		0		1167.4
Total	1430.2		1436.5		0

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	05:20 (109.0) [11] !Fall 2012!					05:40 (109.0) [10] !Fall 2012!					06:00 (109.0) [5] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	4.3		0		4.3	2.5		0		2.5	8.4		0		8.4
800 - 5504 - ALFORD ST @ MAIN ST	0		0		4.3	0		0		2.5	0		0		8.4
1200 - 5505 - 173 ALFORD ST	0	0	0		4.3	0	0	0		2.5	0	0	0		8.4
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		4.3	0		0.1		2.4	0		0.8		7.6
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.2		4.1	0		0.2		2.2	0		0		7.6
2400 - 5508 - BROADWAY @ LANGDON ST	0.1		0		4.2	0		0.1		2.1	0		0.6		7
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0		4.3	0.4		0		2.5	0		0		7
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.2		0		4.5	0		0.3		2.2	0		0		7
3600 - 5695 - BROADWAY @ EVERETT SQ	0.3		1.5		3.3	0.5		0.1		2.6	0.4		0.8		6.6
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.7		1		3	0		0		2.6	0		0		6.6
4400 - 5511 - BROADWAY @ SUMMER ST	0.1		0.1		3	0		0.1		2.5	0.4		0.2		6.8
4800 - 5513 - BROADWAY @ HIGH ST	0		0		3	0		0		2.5	0		1.6		5.2
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0		3	0		0.3		2.2	0		0		5.2
5600 - 5517 - BROADWAY @ REED AVE	0		0		3	0		0.1		2.1	0.2		0.4		5
6000 - 5518 - BROADWAY @ FERRY ST	0.5		0.4		3.1	1.8		0.4		3.5	0.2		1.2		4
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		3.1	0		0		3.5	0		0.2		3.8
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.1		0.1		3.1	0.1		0.1		3.5	0.4		0		4.2
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.1		0		3.2	0		0		3.5	0		0		4.2
7600 - 5521 - BROADWAY @ LYNN ST	0		0		3.2	0		0		3.5	0		0.2		4
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		3.2	0		0.5		3	0		0		4
8400 - 5523 - BROADWAY @ ESTES ST	0		0		3.2	0		0		3	0		0		4
8800 - 5524 - 53 BROADWAY	0		0		3.2	0		0		3	0		0.2		3.8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.1		3.1	0		0		3	0		2		1.8
9600 - 5526 - 170 BROADWAY	0		0		3.1	0		0		3	0		0		1.8
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0.4		2.7	0		0.4		2.6	0		0.2		1.6
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		2.7	0		0		2.6	0		0.2		1.4
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		2.7	0		0		2.6	0		0		1.4
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.2		2.5	0		0		2.6	0		0.2		1.2
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		2.5	0		0		2.6	0		0		1.2
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.1		2.4	0		0.5		2.1	0		0.2		1
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		2.4	0		0		2.1	1.2		0.2		2
12800 - 7417 - WESLEY ST @ LYNN ST	0.6		2.4		0.6	0.4		1.8		0.7	0.3		0.8		1.5
13200 - 7412 - LYNN ST @ BEACH ST	0		0.2	0	0.4	0		0.3	0	0.4	0		0.2	0	1.3
Maximum					4.5					3.5					8.4
Total	7		6.5			5.7		5.3			11.5		10.2		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:22 (109.0) [10] !Fall 2012!					06:40 (109.0) [9] !Fall 2012!					06:56 (109.0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	7.5		0		7.5	12.9		0		12.9	16.8		0		16.8
800 - 5504 - ALFORD ST @ MAIN ST	0		0		7.5	1.6		0		14.5	1.2		0		18
1200 - 5505 - 173 ALFORD ST	0	0	0		7.5	0	1	0		15.5	0	1	0		19
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.9		6.6	0.2		0.2		15.5	0		0.6		18.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.1		6.5	0		0.6		14.9	0.6		1.8		17.2
2400 - 5508 - BROADWAY @ LANGDON ST	0		1		5.5	0.6		5.8		9.7	0.2		1.4		16
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0		5.6	0.1		0		9.8	0.2		0		16.2
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0.4		5.2	0.3		0.6		9.5	0.2		0.6		15.8
3600 - 5695 - BROADWAY @ EVERETT SQ	0.9		0.5		5.6	0.4		1.2		8.7	0.6		2.8		13.6
4000 - 5510 - BROADWAY @ MANSFIELD ST	1		0.2		6.4	0.2		0.3		8.6	0.4		0.6		13.4
4400 - 5511 - BROADWAY @ SUMMER ST	0.2		0.2		6.4	0		0.4		8.2	0.4		0.8		13
4800 - 5513 - BROADWAY @ HIGH ST	0.3		0.2		6.5	0.9		0.8		8.3	0.2		0.2		13
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0		6.5	0.2		0.1		8.4	0		0.4		12.6
5600 - 5517 - BROADWAY @ REED AVE	0		0.5		6	0		0		8.4	0		0.6		12
6000 - 5518 - BROADWAY @ FERRY ST	1.7		1.5		6.2	0.4		1.2		7.6	0.6		2.8		9.8
6400 - 5519 - BROADWAY @ COBURN TERR	0.1		0.3		6	0.1		0		7.7	0		0.4		9.4
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		6	0.3		0.1		7.9	0		0		9.4
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.4		0		6.4	0		0		7.9	0		0.2		9.2
7600 - 5521 - BROADWAY @ LYNN ST	0.3		0		6.7	0.1		2.6		5.4	0		0.8		8.4
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		6.7	0		0		5.4	0		0		8.4
8400 - 5523 - BROADWAY @ ESTES ST	0		0.3		6.4	0.3		0.6		5.1	0.2		0.6		8
8800 - 5524 - 53 BROADWAY	0		0		6.4	0		0.6		4.5	0		2.2		5.8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.7		5.7	0		0.8		3.7	0		0.2		5.6
9600 - 5526 - 170 BROADWAY	0		0.2		5.5	0		0.4		3.3	0		0		5.6
10000 - 5527 - EASTERN AVE @ BROADWAY	0.8		1.2		5.1	0		0.8		2.5	0		0.8		4.8
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		5.1	0		0		2.5	0		0		4.8
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		5.1	0		0.2		2.3	0		0		4.8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.1		5	0		0.1		2.2	0		1		3.8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		5	0		0.1		2.1	0		0		3.8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.5		4.5	0		0.2		1.9	0		0		3.8
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.3		4.2	1		0.4		2.5	0		0		3.8
12800 - 7417 - WESLEY ST @ LYNN ST	0.2		4.1		0.3	0.3		1.6		1.2	0		1.8		2
13200 - 7412 - LYNN ST @ BEACH ST	0		0.2	0	0.1	0		0.2	1	-1.6E-15	0		1	1	-3.8E-15
Maximum					7.5					15.5					19
Total	13.5		13.4			20		20			21.6		21.6		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	07:10 (109.0) [9] !Fall 2012!					07:24 (109.0) [12] !Fall 2012!					07:38 (109.0) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	8.2		0		8.2	11.3		0		11.3	12.3		0		12.3
800 - 5504 - ALFORD ST @ MAIN ST	1.9		0		10.1	0.3		0		11.6	0		0		12.3
1200 - 5505 - 173 ALFORD ST	0	1	0		11.1	0	1	0		12.6	0	0	0		12.3
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		11.1	0		0		12.6	0		0		12.3
2000 - 5507 - BROADWAY @ THORNDIKE ST	8.2		0.1		19.2	5.5		0.3		17.8	3.3		1		14.6
2400 - 5508 - BROADWAY @ LANGDON ST	0.4		0.2		19.4	0.7		0.8		17.7	0.5		1.3		13.8
2800 - 5509 - BROADWAY ST @ BARTLETT ST	2.2		0.3		21.3	1		0		18.7	0.3		0		14.1
3200 - 5565 - BROADWAY @ GLADSTONE ST	5.3		5.2		21.4	4		3.3		19.4	2		2.8		13.3
3600 - 5695 - BROADWAY @ EVERETT SQ	5.1		0.2		26.3	2.8		0.8		21.4	0.8		1.3		12.8
4000 - 5510 - BROADWAY @ MANSFIELD ST	4.2		0.2		30.3	1.3		0.2		22.5	0		0		12.8
4400 - 5511 - BROADWAY @ SUMMER ST	0.8		0.2		30.9	0.5		0.6		22.4	1.5		1.3		13
4800 - 5513 - BROADWAY @ HIGH ST	1.6		0.2		32.3	0.5		1.9		21	0.8		0.5		13.3
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.1		0.2		32.2	0.1		0.1		21	0.3		0		13.6
5600 - 5517 - BROADWAY @ REED AVE	0.1		0.4		31.9	0		0.8		20.2	0		0		13.6
6000 - 5518 - BROADWAY @ FERRY ST	1.9		17.9		15.9	0.7		10		10.9	1		5.3		9.3
6400 - 5519 - BROADWAY @ COBURN TERR	0.1		0.1		15.9	0.3		0.3		10.9	0		0.3		9
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.2		0		16.1	0.1		0.3		10.7	0		0		9
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.1		0.4		15.8	0		0		10.7	0.3		0.3		9
7600 - 5521 - BROADWAY @ LYNN ST	0.3		5.8		10.3	0.3		4.3		6.7	0		2.8		6.2
8000 - 5522 - BROADWAY @ SHUTE ST	0.1		0		10.4	0.2		0.1		6.8	0.3		0		6.5
8400 - 5523 - BROADWAY @ ESTES ST	0.3		0.4		10.3	0.2		0.5		6.5	0		1.3		5.2
8800 - 5524 - 53 BROADWAY	0.6		3.6		7.3	0.1		0.8		5.8	0.3		0.3		5.2
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.2		7.1	0		0.7		5.1	0		1		4.2
9600 - 5526 - 170 BROADWAY	0		0.2		6.9	0		0		5.1	0		0		4.2
10000 - 5527 - EASTERN AVE @ BROADWAY	0.1		1.4		5.6	0.1		0.9		4.3	0		1.3		2.9
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		5.6	0		0		4.3	0		0		2.9
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		5.6	0		0		4.3	0		0		2.9
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.2		5.4	0		0		4.3	0		0.3		2.6
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		5.4	0		0		4.3	0		0		2.6
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.3		5.1	0		0.1		4.2	0		0.3		2.3
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.2		4.9	0		0		4.2	0		0.3		2
12800 - 7417 - WESLEY ST @ LYNN ST	0		3.1		1.8	0		2.5		1.7	0.3		2.3		8.9E-16
13200 - 7412 - LYNN ST @ BEACH ST	0		1.6	1	-0.8	0		0.7	1	-1.6E-15	0		0	0	8.9E-16
Maximum					32.3					22.5					14.6
Total	42		43			29.8		29.7			23.5		23.3		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	07:52 (109.0) [12] !Fall 2012!					08:06 (109.0) [1] !Fall 2012!					08:20 (109.0) [9] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	10		0		10	7		0		7	7.7		0		7.7
800 - 5504 - ALFORD ST @ MAIN ST	0.1		0		10.1	0		0		7	0.1		0		7.8
1200 - 5505 - 173 ALFORD ST	0	0	0		10.1	0	1	0		8	0	1	0		8.8
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		10.1	0		0		8	0		0.4		8.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.6		0.8		9.9	0		0		8	0.2		0.4		8.2
2400 - 5508 - BROADWAY @ LANGDON ST	0.2		0.5		9.6	0		0		8	0		0.1		8.1
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.5		1		9.1	0		0		8	0		0.2		7.9
3200 - 5565 - BROADWAY @ GLADSTONE ST	1.2		0.9		9.4	0		0		8	0.1		0.3		7.7
3600 - 5695 - BROADWAY @ EVERETT SQ	0.7		1.3		8.8	0		1		7	2.1		1		8.8
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.4		0.2		9	2		0		9	0.4		0.4		8.8
4400 - 5511 - BROADWAY @ SUMMER ST	1		1		9	0		0		9	0.4		0.2		9
4800 - 5513 - BROADWAY @ HIGH ST	0		0.3		8.7	0		2		7	0.3		0.9		8.4
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0.7		8	0		0		7	0		0.2		8.2
5600 - 5517 - BROADWAY @ REED AVE	0		0.6		7.4	0		1		6	0		0.1		8.1
6000 - 5518 - BROADWAY @ FERRY ST	0.5		2.2		5.7	1		1		6	0.9		0.2		8.8
6400 - 5519 - BROADWAY @ COBURN TERR	0.3		0.5		5.5	0		0		6	0		0.2		8.6
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.1		0.1		5.5	0		0		6	0.1		0.1		8.6
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		5.5	0		0		6	0		0.1		8.5
7600 - 5521 - BROADWAY @ LYNN ST	0		0.4		5.1	0		0		6	0		0.4		8.1
8000 - 5522 - BROADWAY @ SHUTE ST	0		0.1		5	0		0		6	0.1		0		8.2
8400 - 5523 - BROADWAY @ ESTES ST	0.7		0.6		5.1	0		0		6	0		0.8		7.4
8800 - 5524 - 53 BROADWAY	0		0.5		4.6	0		0		6	0		0.8		6.6
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.2		4.4	0		1		5	0		0.2		6.4
9600 - 5526 - 170 BROADWAY	0		0.2		4.2	0		0		5	0		0.1		6.3
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0.9		3.3	0		1		4	0.6		0.7		6.2
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		3.3	0		0		4	0		0		6.2
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		3.3	0		0		4	0		0		6.2
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		3.3	0		0		4	0		0		6.2
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.1		3.2	0		0		4	0		0.4		5.8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.5		2.7	0		0		4	0		0.2		5.6
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.6		2.1	0		1		3	0.6		0		6.2
12800 - 7417 - WESLEY ST @ LYNN ST	0.2		0.8		1.5	2		2		3	0.6		4.8		2
13200 - 7412 - LYNN ST @ BEACH ST	0		1.4	0	0.1	0		0	1	2	0		0.2	1	0.8
Maximum					10.1					9					9
Total	16.3		16.2			12		10			14.3		13.8		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	08:34 (109.0) [2] !Fall 2012!					08:52 (109.0) [11] !Fall 2012!					09:15 (109.0) [8] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	8.5		0		8.5	5.8		0		5.8	13.5		0		13.5
800 - 5504 - ALFORD ST @ MAIN ST	0		0		8.5	0.3		0		6.1	0.3		0		13.8
1200 - 5505 - 173 ALFORD ST	0	1	0		9.5	0	1	0		7.1	0	4	0		17.8
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		9.5	0		0		7.1	0		0		17.8
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		1		8.5	0		0.4		6.7	0		0.5		17.3
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		8.5	0		0		6.7	0.5		0.4		17.4
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.5		2		7	0.1		0.1		6.7	0		0.3		17.1
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0		7	0.4		0.2		6.9	0		0.4		16.7
3600 - 5695 - BROADWAY @ EVERETT SQ	0		1		6	0.6		1.2		6.3	1		2.6		15.1
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0		6	0.5		0.5		6.3	1.3		0.3		16.1
4400 - 5511 - BROADWAY @ SUMMER ST	1.5		1.5		6	0.2		0		6.5	0.4		0.6		15.9
4800 - 5513 - BROADWAY @ HIGH ST	0.5		1		5.5	0.2		0.3		6.4	0		0.6		15.3
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0		5.5	0.1		0.9		5.6	0.3		1.3		14.3
5600 - 5517 - BROADWAY @ REED AVE	0.5		0		6	0.1		0		5.7	0.1		0.3		14.1
6000 - 5518 - BROADWAY @ FERRY ST	2		0		8	0.5		1.2		5	0.6		2.3		12.4
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		8	0.6		0.2		5.4	0		0.1		12.3
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		8	0.3		0.2		5.5	0.1		0.1		12.3
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		8	0		0		5.5	0		0.1		12.2
7600 - 5521 - BROADWAY @ LYNN ST	0		1		7	0		0		5.5	0		0.4		11.8
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		7	0		0.7		4.8	0		0		11.8
8400 - 5523 - BROADWAY @ ESTES ST	0		0		7	0		0		4.8	0.3		0		12.1
8800 - 5524 - 53 BROADWAY	0		3		4	0		0.5		4.3	0.3		1.8		10.6
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		4	0		0		4.3	0		0		10.6
9600 - 5526 - 170 BROADWAY	0		0		4	0		0.1		4.2	0		0.4		10.2
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		3	0.1		0.5		3.8	0		1.8		8.4
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		3	0		0.2		3.6	0		0		8.4
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.5		2.5	0		0		3.6	0		0.4		8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		2.5	0		0		3.6	0		0.3		7.7
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		2.5	0		0		3.6	0		0		7.7
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		2.5	0		0		3.6	0		0.9		6.8
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		2.5	0.2		0.5		3.3	0		0		6.8
12800 - 7417 - WESLEY ST @ LYNN ST	0		2.5		0	0.5		2.4		1.4	0.1		2.1		4.8
13200 - 7412 - LYNN ST @ BEACH ST	0		0	1	-1	0		0.3	1	0.1	0		1	4	-0.2
Maximum					9.5					7.1					17.8
Total	13.5		14.5			10.4		10			18.6		18.6		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	09:45 (109.0) [14] !Fall 2012!					10:20 (109.0) [8] !Fall 2012!					11:00 (109.0) [13] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	18.2		0		18.2	14.6		0		14.6	19.9		0		19.9
800 - 5504 - ALFORD ST @ MAIN ST	0.2		0		18.4	0.1		0		14.7	0.2		0.1		20
1200 - 5505 - 173 ALFORD ST	0	4	0		22.4	23	8	0		45.7	0	3	0		23
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.2		22.2	0.1		0		45.8	0.1		0.2		22.9
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.4		0.6		22	0.5		0.4		45.9	0.6		0.7		22.8
2400 - 5508 - BROADWAY @ LANGDON ST	0.4		0.9		21.5	0.5		0.5		45.9	0.4		0.4		22.8
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.2		21.6	0		0.4		45.5	0.2		0.2		22.8
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.6		0.7		21.5	0.3		1.3		44.5	0.5		1.7		21.6
3600 - 5695 - BROADWAY @ EVERETT SQ	2		2.5		21	3.4		2.9		45	2.5		2.9		21.2
4000 - 5510 - BROADWAY @ MANSFIELD ST	1		1.3		20.7	0.8		0.8		45	1.8		0.7		22.3
4400 - 5511 - BROADWAY @ SUMMER ST	0.7		1.1		20.3	0		0.6		44.4	0.2		0.8		21.7
4800 - 5513 - BROADWAY @ HIGH ST	0.8		0.7		20.4	0.5		1.3		43.6	0.5		2		20.2
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.5		1.8		19.1	0.8		1.5		42.9	0.7		1.5		19.4
5600 - 5517 - BROADWAY @ REED AVE	0.1		1.1		18.1	0.6		0.5		43	0.5		0.7		19.2
6000 - 5518 - BROADWAY @ FERRY ST	1.4		2.4		17.1	0.8		3.5		40.3	0.8		4.2		15.8
6400 - 5519 - BROADWAY @ COBURN TERR	0.2		0.9		16.4	0.3		0.4		40.2	0.1		0.9		15
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.2		0.2		16.4	0.3		0.1		40.4	0.2		0.5		14.7
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.6		15.8	0		0.1		40.3	0.2		0.5		14.4
7600 - 5521 - BROADWAY @ LYNN ST	0.4		1		15.2	0.3		0.4		40.2	0.2		1.5		13.1
8000 - 5522 - BROADWAY @ SHUTE ST	0.2		0.4		15	0		0.5		39.7	0.1		0.7		12.5
8400 - 5523 - BROADWAY @ ESTES ST	0		0.3		14.7	0		0.8		38.9	0.2		0.7		12
8800 - 5524 - 53 BROADWAY	0.1		2.1		12.7	0.3		2.1		37.1	0.3		3.5		8.8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0.1		0.6		12.2	0		1		36.1	0		0.7		8.1
9600 - 5526 - 170 BROADWAY	0		0.5		11.7	0		0.3		35.8	0		0.2		7.9
10000 - 5527 - EASTERN AVE @ BROADWAY	0		2.6		9.1	0		1		34.8	0.1		0.8		7.2
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		9.1	0		0		34.8	0		0.2		7
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.1		9	0		0.1		34.7	0		0.1		6.9
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		9	0		0.3		34.4	0		0.5		6.4
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.1		8.9	0		0.1		34.3	0		0.4		6
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.4		8.5	0		0		34.3	0		0.6		5.4
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		8.5	0		0.1		34.2	0		0		5.4
12800 - 7417 - WESLEY ST @ LYNN ST	0.4		3.9		5	0		1.8		32.4	1.2		3.5		3.1
13200 - 7412 - LYNN ST @ BEACH ST	0		0.9	4	0.1	0		1.4	8	23	0		0.4	3	-0.3
Maximum					22.4					45.9					23
Total	28.2		28.1			23.9		23.9			31.3		31.8		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:40 (109.0) [13] !Fall 2012!					12:20 (109.0) [12] !Fall 2012!					13:00 (109.0) [13] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	24.5		0		24.5	26.1		0		26.1	29.4		0		29.4
800 - 5504 - ALFORD ST @ MAIN ST	0		0		24.5	0.2		0.1		26.2	0		0.1		29.3
1200 - 5505 - 173 ALFORD ST	0	4	0.1		28.4	0.1	8	0		34.3	0	3	0.1		32.2
1600 - 5506 - BROADWAY @ DEXTER ST	0.1		0.4		28.1	0		0		34.3	0		0.2		32
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.6		0.7		28	0.3		0.4		34.2	0.2		0.4		31.8
2400 - 5508 - BROADWAY @ LANGDON ST	0.2		0.9		27.3	0.2		0.9		33.5	0.4		0.6		31.6
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.5		26.8	0.5		0.4		33.6	0.3		0.6		31.3
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.2		0.5		26.5	0.6		0.9		33.3	0.5		1.5		30.3
3600 - 5695 - BROADWAY @ EVERETT SQ	3.3		3.7		26.1	3.7		3.3		33.7	3.2		3.8		29.7
4000 - 5510 - BROADWAY @ MANSFIELD ST	1.9		1.5		26.5	1.4		2		33.1	1.7		1.5		29.9
4400 - 5511 - BROADWAY @ SUMMER ST	0.5		0.3		26.7	0.3		0.5		32.9	1.1		1.6		29.4
4800 - 5513 - BROADWAY @ HIGH ST	1		2.2		25.5	1		3.5		30.4	0.5		2		27.9
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.8		1.4		24.9	0.7		1.9		29.2	0.3		1.4		26.8
5600 - 5517 - BROADWAY @ REED AVE	0.2		1.2		23.9	0.4		1.3		28.3	0.6		0.8		26.6
6000 - 5518 - BROADWAY @ FERRY ST	0.4		3.2		21.1	1		4.8		24.5	1.4		6.3		21.7
6400 - 5519 - BROADWAY @ COBURN TERR	0.7		0.8		21	0.2		0.8		23.9	0.2		0.5		21.4
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.1		0.8		20.3	0.7		0.7		23.9	0.1		0.8		20.7
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.2		0.8		19.7	0		0.5		23.4	0		1.2		19.5
7600 - 5521 - BROADWAY @ LYNN ST	0		1.6		18.1	0.3		1.5		22.2	0.1		2.4		17.2
8000 - 5522 - BROADWAY @ SHUTE ST	0.1		1.2		17	0.4		0.7		21.9	0.1		1.2		16.1
8400 - 5523 - BROADWAY @ ESTES ST	0.1		1.2		15.9	0.3		0.7		21.5	0		1.3		14.8
8800 - 5524 - 53 BROADWAY	0.3		2.8		13.4	0.2		2.2		19.5	0.5		4.3		11
9200 - 5525 - BROADWAY OPP SHEAFE ST	0.2		0.4		13.2	0		0.8		18.7	0		0.1		10.9
9600 - 5526 - 170 BROADWAY	0		0.6		12.6	0		0.8		17.9	0		0.4		10.5
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0.8		11.8	0		2		15.9	0		2.2		8.3
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		11.8	0		0		15.9	0.1		0		8.4
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		11.8	0		0.4		15.5	0		0.2		8.2
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.3		11.5	0		0.1		15.4	0		0.5		7.7
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.8		10.7	0		0.8		14.6	0		0.3		7.4
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.5		10.2	0.1		0.9		13.8	0		0.5		6.9
12400 - 7413 - BEACH ST @ HANCOCK RD	0.1		0.6		9.7	0		0		13.8	1.5		0.8		7.6
12800 - 7417 - WESLEY ST @ LYNN ST	0.7		5.1		5.3	0		4.8		9	0		3		4.6
13200 - 7412 - LYNN ST @ BEACH ST	0		1	4	0.3	0		0.9	8	0.1	0		0.6	3	1
Maximum					28.4					34.3					32.2
Total	36.2		36			38.6		38.5			41.8		41.1		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	13:40 (109.0) [6] !Fall 2012!					14:20 (109.0) [6] !Fall 2012!					14:40 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	30.2		0		30.2	29.7		0		29.7	11		0		11
800 - 5504 - ALFORD ST @ MAIN ST	0		0		30.2	0.4		0.3		29.8	0		0		11
1200 - 5505 - 173 ALFORD ST	0	4	0		34.2	0	4	0		33.8	0	3	0		14
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.3		33.9	0		0.8		33	0		0		14
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.7		0.5		34.1	0.3		0.8		32.5	0		2		12
2400 - 5508 - BROADWAY @ LANGDON ST	0.3		0.8		33.6	0.8		0.3		33	5		1		16
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.5		0		34.1	1.7		0.3		34.4	0		1		15
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.3		2		32.4	7.7		5.2		36.9	0		3		12
3600 - 5695 - BROADWAY @ EVERETT SQ	4		2.7		33.7	5.5		2.7		39.7	5		5		12
4000 - 5510 - BROADWAY @ MANSFIELD ST	1.7		1.2		34.2	1.7		1.2		40.2	11		3		20
4400 - 5511 - BROADWAY @ SUMMER ST	1.5		1.2		34.5	0.2		2		38.4	5		4		21
4800 - 5513 - BROADWAY @ HIGH ST	0.7		1.7		33.5	0.5		2.3		36.6	0		0		21
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		1.5		32	2		3.8		34.8	0		5		16
5600 - 5517 - BROADWAY @ REED AVE	0.2		2		30.2	0		1.3		33.5	5		2		19
6000 - 5518 - BROADWAY @ FERRY ST	1.8		7.3		24.7	5.7		5.2		34	0		3		16
6400 - 5519 - BROADWAY @ COBURN TERR	0.8		0.8		24.7	0.8		1.3		33.5	5		1		20
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.3		1.5		23.5	2.3		0.7		35.1	0		2		18
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.3		23.2	1.2		0.8		35.5	0		0		18
7600 - 5521 - BROADWAY @ LYNN ST	0		1.2		22	2.5		3.7		34.3	0		1		17
8000 - 5522 - BROADWAY @ SHUTE ST	0.5		2.2		20.3	0.7		3.2		31.8	0		1		16
8400 - 5523 - BROADWAY @ ESTES ST	0.2		2.2		18.3	0		2		29.8	0		0		16
8800 - 5524 - 53 BROADWAY	0		3.3		15	1.2		7.3		23.7	0		7		9
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.3		14.7	0		0.8		22.9	0		1		8
9600 - 5526 - 170 BROADWAY	0		0.5		14.2	0		0.7		22.2	0		0		8
10000 - 5527 - EASTERN AVE @ BROADWAY	0		2.7		11.5	0		2.7		19.5	0		0		8
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		11.5	0		0		19.5	0		0		8
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		11.5	0.2		0		19.7	0		0		8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.3		11.2	0		1.7		18	0		1		7
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		1.3		9.9	0		0.8		17.2	0		0		7
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.3		9.6	0		3.2		14	0		0		7
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.7		8.9	0		0.5		13.5	0		0		7
12800 - 7417 - WESLEY ST @ LYNN ST	0.2		3.8		5.3	0.2		12.8		0.9	0		3		4
13200 - 7412 - LYNN ST @ BEACH ST	0		1.2	4	0.1	0		1	4	-4.1	0		1	3	0
Maximum					34.5					40.2					21
Total	43.8		43.8			65.1		69.5			47		47		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	15:00 (109.0) [6] !Fall 2012!					15:20 (109.0) [2] !Fall 2012!					15:40 (109.0) [6] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	34		0		34	47		0		47	33		0		33
800 - 5504 - ALFORD ST @ MAIN ST	0.2		0		34.2	0		0		47	1		0		34
1200 - 5505 - 173 ALFORD ST	0.2	2	0		36.4	0	3	0		50	0.2	2	0		36.2
1600 - 5506 - BROADWAY @ DEXTER ST	0		1.2		35.2	0		0		50	0		0		36.2
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.2		0.2		35.2	0		1		49	0		1		35.2
2400 - 5508 - BROADWAY @ LANGDON ST	0		1.2		34	1		0.5		49.5	0.2		0.8		34.6
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.3		0.2		34.1	0		0		49.5	0.2		0.7		34.1
3200 - 5565 - BROADWAY @ GLADSTONE ST	1		1.5		33.6	0		2.5		47	0.7		1		33.8
3600 - 5695 - BROADWAY @ EVERETT SQ	2		6.2		29.4	6		6		47	2		4		31.8
4000 - 5510 - BROADWAY @ MANSFIELD ST	1.3		0.8		29.9	1.5		4		44.5	0.7		1.3		31.2
4400 - 5511 - BROADWAY @ SUMMER ST	1.7		1.5		30.1	0.5		1		44	1.8		1.2		31.8
4800 - 5513 - BROADWAY @ HIGH ST	0.3		2.8		27.6	1.5		1.5		44	0.8		0.5		32.1
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.3		3.3		24.6	0		1.5		42.5	0.2		1		31.3
5600 - 5517 - BROADWAY @ REED AVE	0.5		1		24.1	0.5		7		36	0		3.2		28.1
6000 - 5518 - BROADWAY @ FERRY ST	2.7		3.3		23.5	1		10.5		26.5	1		7.3		21.8
6400 - 5519 - BROADWAY @ COBURN TERR	0		0.3		23.2	0		1.5		25	0		1.2		20.6
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.3		1.5		22	0		1		24	0.2		2.2		18.6
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1		21	0.5		2		22.5	0		0.8		17.8
7600 - 5521 - BROADWAY @ LYNN ST	0.2		0.7		20.5	0.5		4.5		18.5	0.5		2		16.3
8000 - 5522 - BROADWAY @ SHUTE ST	0.2		1		19.7	0		1		17.5	0		1.2		15.1
8400 - 5523 - BROADWAY @ ESTES ST	0		3.2		16.5	0		3.5		14	0.2		2		13.3
8800 - 5524 - 53 BROADWAY	0		1.7		14.8	1		1		14	0		2		11.3
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		1		13.8	0		1		13	0		0.3		11
9600 - 5526 - 170 BROADWAY	0		1.8		12	0		0		13	0		0.7		10.3
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1.7		10.3	0		4		9	0		1.2		9.1
10400 - 5528 - OPP 1236 EASTERN AVE	0		0.2		10.1	0		0		9	0.2		0		9.3
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.7		9.4	0		0		9	0		0.7		8.6
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		1.5		7.9	0		0		9	0		1.7		6.9
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		2.2		5.7	0		1		8	0		0.2		6.7
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.7		5	0		1		7	0		1		5.7
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.3		4.7	0		2		5	0		0		5.7
12800 - 7417 - WESLEY ST @ LYNN ST	0		2.2		2.5	0		1		4	0		3.3		2.4
13200 - 7412 - LYNN ST @ BEACH ST	0		0.7	2	-0.2	0		1	3	0	0		0.5	2	-0.1
Maximum					36.4					50					36.2
Total	45.3		45.3			61		61			42.7		42.8		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	16:00 (109.0) [1] !Fall 2012!					16:15 (109.0) [1] !Fall 2012!					16:30 (109.0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	28		0		28	57		0		57	29.8		0		29.8
800 - 5504 - ALFORD ST @ MAIN ST	0		0		28	0		0		57	1.9		0.5		31.2
1200 - 5505 - 173 ALFORD ST	0	3	0		31	0	3	0		60	0	3	0		34.2
1600 - 5506 - BROADWAY @ DEXTER ST	0		1		30	0		0		60	0		0		34.2
2000 - 5507 - BROADWAY @ THORNDIKE ST	1		0		31	0		0		60	0.3		0.8		33.7
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		31	0		0		60	0.5		0.3		33.9
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		2		29	0		0		60	0		0.9		33
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		1		28	0		2		58	0.8		1.3		32.5
3600 - 5695 - BROADWAY @ EVERETT SQ	10		6		32	3		11		50	3.5		4.5		31.5
4000 - 5510 - BROADWAY @ MANSFIELD ST	1		0		33	0		3		47	1.4		1.3		31.6
4400 - 5511 - BROADWAY @ SUMMER ST	0		0		33	1		0		48	1.5		1		32.1
4800 - 5513 - BROADWAY @ HIGH ST	1		0		34	0		0		48	0.4		2.6		29.9
5200 - 5514 - BROADWAY @ LEXINGTON ST	1		1		34	1		5		44	0.5		1.3		29.1
5600 - 5517 - BROADWAY @ REED AVE	0		1		33	2		1		45	0.1		1.5		27.7
6000 - 5518 - BROADWAY @ FERRY ST	2		10		25	0		5		40	0.9		4		24.6
6400 - 5519 - BROADWAY @ COBURN TERR	0		1		24	0		0		40	0.3		2		22.9
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		2		22	0		5		35	0.1		0.5		22.5
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1		21	0		2		33	0.5		2		21
7600 - 5521 - BROADWAY @ LYNN ST	0		1		20	0		4		29	0.5		2.8		18.7
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		20	0		0		29	0.1		1.3		17.5
8400 - 5523 - BROADWAY @ ESTES ST	0		2		18	0		4		25	0		1.9		15.6
8800 - 5524 - 53 BROADWAY	0		0		18	0		4		21	0.3		3.3		12.6
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		1		17	0		2		19	0		0.5		12.1
9600 - 5526 - 170 BROADWAY	0		3		14	0		0		19	0		0.5		11.6
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		13	0		0		19	0		1.4		10.2
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		13	0		0		19	0		0		10.2
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		3		10	0		0		19	0		0		10.2
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		10	0		0		19	0		1.1		9.1
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		10	0		4		15	0		0.6		8.5
12000 - 5532 - EASTERN AVE @ LYNN ST	0		3		7	0		2		13	0		0.5		8
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		7	0		2		11	1.4		2.1		7.3
12800 - 7417 - WESLEY ST @ LYNN ST	0		3		4	0		6		5	0.3		3		4.6
13200 - 7412 - LYNN ST @ BEACH ST	0		1	3	0	0		2	3	0	0		0.5	3	1.1
Maximum					34					60					34.2
Total	44		44			64		64			44.8		43.6		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	16:45 (109.0) [1] !Fall 2012!					17:00 (109.0) [1] !Fall 2012!					17:15 (109.0) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	20		0		20	12		0		12	28		0		28
800 - 5504 - ALFORD ST @ MAIN ST	1		0		21	3		0		15	0.8		0		28.8
1200 - 5505 - 173 ALFORD ST	0	2	0		23	0	0	0		15	0	0	0		28.8
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		23	0		0		15	0.1		0.3		28.6
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		23	0		0		15	0.1		0.6		28.1
2400 - 5508 - BROADWAY @ LANGDON ST	0		1		22	0		0		15	0.5		0.3		28.3
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		22	3		0		18	0.2		0.2		28.3
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0		22	1		0		19	0.1		1.2		27.2
3600 - 5695 - BROADWAY @ EVERETT SQ	2		2		22	1		5		15	1.2		2.1		26.3
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0		22	1		0		16	0.1		2		24.4
4400 - 5511 - BROADWAY @ SUMMER ST	1		1		22	1		0		17	0.3		1		23.7
4800 - 5513 - BROADWAY @ HIGH ST	2		2		22	0		0		17	0.4		2.1		22
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		1		21	3		0		20	0.1		1.8		20.3
5600 - 5517 - BROADWAY @ REED AVE	0		2		19	0		1		19	0.1		1.6		18.8
6000 - 5518 - BROADWAY @ FERRY ST	4		3		20	4		1		22	1.1		4.4		15.5
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		20	1		0		23	0.4		1		14.9
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		20	1		0		24	0		0.5		14.4
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1		19	0		1		23	0.1		0.7		13.8
7600 - 5521 - BROADWAY @ LYNN ST	0		1		18	0		4		19	0		2.7		11.1
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		18	0		0		19	0		1.1		10
8400 - 5523 - BROADWAY @ ESTES ST	0		1		17	0		1		18	0		1.8		8.2
8800 - 5524 - 53 BROADWAY	0		2		15	0		2		16	0.2		0.9		7.5
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		15	0		0		16	0		0.5		7
9600 - 5526 - 170 BROADWAY	0		0		15	0		0		16	0		1.1		5.9
10000 - 5527 - EASTERN AVE @ BROADWAY	0		2		13	0		6		10	0		1.4		4.5
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		13	0		0		10	0		0.2		4.3
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		13	0		0		10	0		0.1		4.2
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		13	0		0		10	0		0.4		3.8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		13	0		0		10	0		1		2.8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		3		10	0		0		10	0		0.3		2.5
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		10	0		0		10	0.7		0.1		3.1
12800 - 7417 - WESLEY ST @ LYNN ST	0		8		2	0		10		0	0		2.6		0.5
13200 - 7412 - LYNN ST @ BEACH ST	0		0	2	0	0		0	0	0	0		0.3	0	0.2
Maximum					23					24					28.8
Total	30		30			31		31			34.5		34.3		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	17:30 (109.0) [11] !Fall 2012!					17:45 (109.0) [2] !Spring 2013!					18:00 (109.0) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	35		0		35	28.5		0		28.5	17.3		0		17.3
800 - 5504 - ALFORD ST @ MAIN ST	0.4		0.1		35.3	0.5		0		29	4.7		0.3		21.7
1200 - 5505 - 173 ALFORD ST	0.1	0	0		35.4	0	0	0		29	0.3	1	0.3		22.7
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.1		35.3	0		0		29	0		1.3		21.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.4		0.7		35	1		1.5		28.5	0		0		21.4
2400 - 5508 - BROADWAY @ LANGDON ST	0.4		1.1		34.3	0		0		28.5	3.7		0.7		24.4
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.6		33.7	1		1		28.5	0.7		0.3		24.8
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.2		0.6		33.3	0		0.5		28	0		0.7		24.1
3600 - 5695 - BROADWAY @ EVERETT SQ	3		4.3		32	1.5		2		27.5	4.3		3.3		25.1
4000 - 5510 - BROADWAY @ MANSFIELD ST	1.5		2.4		31.1	0		0		27.5	0.3		1.7		23.7
4400 - 5511 - BROADWAY @ SUMMER ST	0.5		1.2		30.4	0.5		2		26	0		0.3		23.4
4800 - 5513 - BROADWAY @ HIGH ST	0.1		3.2		27.3	0		4.5		21.5	0		3		20.4
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.1		3		24.4	0.5		1		21	0		2		18.4
5600 - 5517 - BROADWAY @ REED AVE	0.2		2.5		22.1	0		4.5		16.5	0.7		1		18.1
6000 - 5518 - BROADWAY @ FERRY ST	1.1		5.8		17.4	3		0.5		19	4.3		3		19.4
6400 - 5519 - BROADWAY @ COBURN TERR	0.4		0.3		17.5	1.5		0		20.5	0		0.7		18.7
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.2		1.8		15.9	0		2.5		18	0		1		17.7
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1.3		14.6	0		0		18	0		2.3		15.4
7600 - 5521 - BROADWAY @ LYNN ST	0.4		1.7		13.3	0		2		16	0		0.3		15.1
8000 - 5522 - BROADWAY @ SHUTE ST	0		1.6		11.7	0		0.5		15.5	0		2.3		12.8
8400 - 5523 - BROADWAY @ ESTES ST	0		1.7		10	0		6		9.5	0		2.3		10.5
8800 - 5524 - 53 BROADWAY	0		2.1		7.9	0.5		3.5		6.5	0		1.3		9.2
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.5		7.4	0		1		5.5	0		2		7.2
9600 - 5526 - 170 BROADWAY	0		0.3		7.1	0		2		3.5	0		0.7		6.5
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0.7		6.4	0		1.5		2	0		0.7		5.8
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		6.4	0		0		2	0		0		5.8
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.4		6	0		0		2	0		0		5.8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.2		5.8	0		0		2	0		0		5.8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.7		5.1	0		1		1	0		0.7		5.1
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.6		4.5	0		0		1	0		0		5.1
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		4.5	0		0		1	0		0		5.1
12800 - 7417 - WESLEY ST @ LYNN ST	0.4		3.7		1.2	0		1		0	0		2.3		2.8
13200 - 7412 - LYNN ST @ BEACH ST	0		0.4	0	0.8	0		0	0	0	0		1.7	1	0.1
Maximum					35.4					29					25.1
Total	44		43.6			38.5		38.5			36.3		36.3		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
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(Urban Transportation Associates)

	18:15 (109.0) [10] !Fall 2012!					18:30 (109.0) [1] !Fall 2012!					18:45 (109.0) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	28.3		0		28.3	12		0		12	31.9		0		31.9
800 - 5504 - ALFORD ST @ MAIN ST	0.8		0		29.1	2		0		14	0.5		0.3		32.1
1200 - 5505 - 173 ALFORD ST	0	1	0		30.1	0	0	0		14	0	1	0		33.1
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.3		29.8	0		0		14	0		0		33.1
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		1.6		28.2	0		0		14	0.1		0.6		32.6
2400 - 5508 - BROADWAY @ LANGDON ST	0.1		0.6		27.7	0		0		14	0		0.4		32.2
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.2		0.7		27.2	0		0		14	0		0.9		31.3
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.6		1.6		26.2	0		0		14	0		2.5		28.8
3600 - 5695 - BROADWAY @ EVERETT SQ	0.8		3.8		23.2	1		1		14	2		2.8		28
4000 - 5510 - BROADWAY @ MANSFIELD ST	1.6		1.3		23.5	0		0		14	0.3		0.9		27.4
4400 - 5511 - BROADWAY @ SUMMER ST	0.4		0.6		23.3	0		0		14	0.9		0.8		27.5
4800 - 5513 - BROADWAY @ HIGH ST	0.7		2.4		21.6	0		1		13	0.6		4		24.1
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.6		2.8		19.4	1		0		14	0		1.3		22.8
5600 - 5517 - BROADWAY @ REED AVE	0.3		1.2		18.5	0		0		14	0.5		1.3		22
6000 - 5518 - BROADWAY @ FERRY ST	0.5		4.4		14.6	0		1		13	0.6		4.5		18.1
6400 - 5519 - BROADWAY @ COBURN TERR	0.2		0.8		14	0		1		12	0.1		0.6		17.6
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.3		0.8		13.5	0		0		12	0.3		0.6		17.3
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1.3		12.2	0		0		12	0		0.5		16.8
7600 - 5521 - BROADWAY @ LYNN ST	0		0.9		11.3	0		1		11	0		1.6		15.2
8000 - 5522 - BROADWAY @ SHUTE ST	0		1.3		10	0		0		11	0.1		1.6		13.7
8400 - 5523 - BROADWAY @ ESTES ST	0		1.4		8.6	0		0		11	0.1		2.5		11.3
8800 - 5524 - 53 BROADWAY	0.1		1.6		7.1	1		1		11	0.1		3		8.4
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.7		6.4	0		0		11	0		1		7.4
9600 - 5526 - 170 BROADWAY	0		0.1		6.3	0		0		11	0.1		0		7.5
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		5.3	0		3		8	0		1.8		5.7
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		5.3	0		0		8	0		0		5.7
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.1		5.2	0		0		8	0		0		5.7
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.7		4.5	0		0		8	0		0.8		4.9
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.2		4.3	0		0		8	0		0		4.9
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.7		3.6	0		1		7	0		1.6		3.3
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.2		3.4	0		0		7	0		0		3.3
12800 - 7417 - WESLEY ST @ LYNN ST	0		1.8		1.6	0		6		1	0.3		2.3		1.3
13200 - 7412 - LYNN ST @ BEACH ST	0		0.6	1	-4.1E-15	0		1	0	0	0		0.4	1	-0.1
Maximum					30.1					14					33.1
Total	35.5		35.5			17		17			38.5		38.3		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	19:00 (109.0) [6] !Fall 2012!					19:15 (109.0) [14] !Fall 2012!					19:30 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	22.3		0		22.3	28.4		0		28.4	15		0		15
800 - 5504 - ALFORD ST @ MAIN ST	0.3		0.2		22.4	0.1		0		28.5	0		0		15
1200 - 5505 - 173 ALFORD ST	0	2	0		24.4	0	2	0		30.5	0	2	0		17
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		24.4	0		0.1		30.4	0		0		17
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.2		24.2	0.1		0.6		29.9	0		1		16
2400 - 5508 - BROADWAY @ LANGDON ST	0		0.2		24	0.4		0.4		29.9	0		0		16
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		24	0.1		0		30	0		0		16
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.5		1.5		23	0.1		0.7		29.4	0		1		15
3600 - 5695 - BROADWAY @ EVERETT SQ	1.3		2		22.3	1.4		2.9		27.9	2		0		17
4000 - 5510 - BROADWAY @ MANSFIELD ST	1		0.7		22.6	0.5		1.1		27.3	1		2		16
4400 - 5511 - BROADWAY @ SUMMER ST	0.3		1.2		21.7	0.4		0.8		26.9	0		3		13
4800 - 5513 - BROADWAY @ HIGH ST	0.8		2		20.5	0.1		3.3		23.7	0		0		13
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0.7		19.8	0.1		2.2		21.6	0		2		11
5600 - 5517 - BROADWAY @ REED AVE	0.5		1.8		18.5	0.1		2.5		19.2	0		0		11
6000 - 5518 - BROADWAY @ FERRY ST	0.7		4		15.2	1.1		3.9		16.4	2		0		13
6400 - 5519 - BROADWAY @ COBURN TERR	0.5		0.3		15.4	0.3		0.7		16	0		1		12
6800 - 5515 - BROADWAY @ GLEDHILL ST	1		0.7		15.7	0.1		0.9		15.2	0		0		12
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.5		15.2	0		0.7		14.5	0		0		12
7600 - 5521 - BROADWAY @ LYNN ST	0.2		0.5		14.9	0		1.9		12.6	0		0		12
8000 - 5522 - BROADWAY @ SHUTE ST	0.3		1.5		13.7	0		1.5		11.1	0		0		12
8400 - 5523 - BROADWAY @ ESTES ST	0		0		13.7	0		1.3		9.8	0		4		8
8800 - 5524 - 53 BROADWAY	0.2		2		11.9	0.1		2.1		7.8	0		0		8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.7		11.2	0.1		0.3		7.6	0		0		8
9600 - 5526 - 170 BROADWAY	0.2		0.5		10.9	0.1		0.9		6.8	0		0		8
10000 - 5527 - EASTERN AVE @ BROADWAY	0.2		3.7		7.4	0		1.6		5.2	0		2		6
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		7.4	0		0		5.2	0		0		6
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		7.4	0		0.3		4.9	0		0		6
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.7		6.7	0		0.1		4.8	0		0		6
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.7		6	0		0.3		4.5	0		0		6
12000 - 5532 - EASTERN AVE @ LYNN ST	0		1		5	0		0.3		4.2	0		0		6
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		5	0.1		0.6		3.7	0		0		6
12800 - 7417 - WESLEY ST @ LYNN ST	0		2.7		2.3	0		1.2		2.5	0		4		2
13200 - 7412 - LYNN ST @ BEACH ST	0		0.7	2	-0.4	0		0.5	2	7.1E-15	0		0	2	0
Maximum					24.4					30.5					17
Total	30.3		30.3			33.7		33.7			20		20		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	19:45 (109.0) [7] !Fall 2012!					20:00 (109.1) [3] !Fall 2012!					20:30 (109.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	37.4		0		37.4	38		0		38	36		0		36
800 - 5504 - ALFORD ST @ MAIN ST	0.1		0		37.5	1.3		0		39.3	0		0		36
1200 - 5505 - 173 ALFORD ST	0	3	0		40.5	0	1	0		40.3	0	1	0		37
1600 - 5506 - BROADWAY @ DEXTER ST	0.1		0		40.6	0		0		40.3	0		0		37
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.3		1.1		39.8	0		4.3		36	0		0		37
2400 - 5508 - BROADWAY @ LANGDON ST	0.6		0.3		40.1	0		0.3		35.7	1		1		37
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.3		39.8	0.3		0.3		35.7	0		0		37
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.6		4		36.4	0		2		33.7	0		1		36
3600 - 5695 - BROADWAY @ EVERETT SQ	0.9		4		33.3	0.7		4		30.4	1.5		12.5		25
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.6		1		32.9	0.7		2.3		28.8	0		3		22
4400 - 5511 - BROADWAY @ SUMMER ST	0.1		1.6		31.4	0.3		0.7		28.4	0.5		0.5		22
4800 - 5513 - BROADWAY @ HIGH ST	0.4		3.9		27.9	0.3		6		22.7	0		1.5		20.5
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.1		2.7		25.3	0		2.3		20.4	0		2		18.5
5600 - 5517 - BROADWAY @ REED AVE	0.3		1.9		23.7	0		3.3		17.1	0		1.5		17
6000 - 5518 - BROADWAY @ FERRY ST	0.3		8.9		15.1	0		16	1	0.1	0		16	1	0
6400 - 5519 - BROADWAY @ COBURN TERR	0.3		0.7		14.7	.		.		#VALUE!	.		.		#VALUE!
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.1		1		13.8	.		.		#VALUE!	.		.		#VALUE!
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.4		13.4	.		.		#VALUE!	.		.		#VALUE!
7600 - 5521 - BROADWAY @ LYNN ST	0		0.9		12.5	.		.		#VALUE!	.		.		#VALUE!
8000 - 5522 - BROADWAY @ SHUTE ST	0		1.3		11.2	.		.		#VALUE!	.		.		#VALUE!
8400 - 5523 - BROADWAY @ ESTES ST	0		0.3		10.9	.		.		#VALUE!	.		.		#VALUE!
8800 - 5524 - 53 BROADWAY	0.3		1		10.2	.		.		#VALUE!	.		.		#VALUE!
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		10.2	.		.		#VALUE!	.		.		#VALUE!
9600 - 5526 - 170 BROADWAY	0		0.7		9.5	.		.		#VALUE!	.		.		#VALUE!
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1.7		7.8	.		.		#VALUE!	.		.		#VALUE!
10400 - 5528 - OPP 1236 EASTERN AVE	0		0.3		7.5	.		.		#VALUE!	.		.		#VALUE!
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.3		7.2	.		.		#VALUE!	.		.		#VALUE!
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.4		6.8	.		.		#VALUE!	.		.		#VALUE!
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.3		6.5	.		.		#VALUE!	.		.		#VALUE!
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		6.5	.		.		#VALUE!	.		.		#VALUE!
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.4		6.1	.		.		#VALUE!	.		.		#VALUE!
12800 - 7417 - WESLEY ST @ LYNN ST	0		1.4		4.7	.		.		#VALUE!	.		.		#VALUE!
13200 - 7412 - LYNN ST @ BEACH ST	0		1.6	3	0.1	.		.		#VALUE!	.		.		#VALUE!
Maximum					40.6					#VALUE!					#VALUE!
Total	42.6		42.3			41.7		41.7			39		39		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	20:45 (109.0) [8] !Fall 2012!					21:00 (109.1) [3] !Fall 2012!					21:30 (109.1) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	36.9		0		36.9	41.3		0		41.3	22		0		22
800 - 5504 - ALFORD ST @ MAIN ST	0.8		0		37.7	0.3		0		41.6	0		0		22
1200 - 5505 - 173 ALFORD ST	0	2	0		39.7	0	1	0		42.6	0	1	0		23
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.1		39.6	0.3		1.3		41.6	0		0.3		22.7
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.4		39.2	0.3		1.3		40.6	0.7		0.3		23.1
2400 - 5508 - BROADWAY @ LANGDON ST	0		0.5		38.7	0		0.3		40.3	0.7		0.7		23.1
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.1		38.6	0		0		40.3	0		1.3		21.8
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.4		0.9		38.1	0		2		38.3	0		2.7		19.1
3600 - 5695 - BROADWAY @ EVERETT SQ	2.4		6.4		34.1	0.7		6		33	1.7		2.7		18.1
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.3		1.1		33.3	0		2.3		30.7	0.3		3		15.4
4400 - 5511 - BROADWAY @ SUMMER ST	0		2.1		31.2	0		2.7		28	0		2.3		13.1
4800 - 5513 - BROADWAY @ HIGH ST	0.5		3		28.7	0		7		21	0		6.7		6.4
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		1.4		27.3	0		2		19	0		2		4.4
5600 - 5517 - BROADWAY @ REED AVE	0		1.4		25.9	0		1.3		17.7	0		2.3		2.1
6000 - 5518 - BROADWAY @ FERRY ST	3		6.3		22.6	0		16.7	1	0	0		19.3	1	-18.2
6400 - 5519 - BROADWAY @ COBURN TERR	0		0.6		22	.		.		#VALUE!	.		.		#VALUE!
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.3		1.6		20.7	.		.		#VALUE!	.		.		#VALUE!
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.1		0.4		20.4	.		.		#VALUE!	.		.		#VALUE!
7600 - 5521 - BROADWAY @ LYNN ST	0.1		1.3		19.2	.		.		#VALUE!	.		.		#VALUE!
8000 - 5522 - BROADWAY @ SHUTE ST	0		2.1		17.1	.		.		#VALUE!	.		.		#VALUE!
8400 - 5523 - BROADWAY @ ESTES ST	0		0.8		16.3	.		.		#VALUE!	.		.		#VALUE!
8800 - 5524 - 53 BROADWAY	1		1.4		15.9	.		.		#VALUE!	.		.		#VALUE!
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.4		15.5	.		.		#VALUE!	.		.		#VALUE!
9600 - 5526 - 170 BROADWAY	0.1		0.3		15.3	.		.		#VALUE!	.		.		#VALUE!
10000 - 5527 - EASTERN AVE @ BROADWAY	0		2		13.3	.		.		#VALUE!	.		.		#VALUE!
10400 - 5528 - OPP 1236 EASTERN AVE	0		0.3		13	.		.		#VALUE!	.		.		#VALUE!
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.4		12.6	.		.		#VALUE!	.		.		#VALUE!
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		1.3		11.3	.		.		#VALUE!	.		.		#VALUE!
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.5		10.8	.		.		#VALUE!	.		.		#VALUE!
12000 - 5532 - EASTERN AVE @ LYNN ST	0		1.8		9	.		.		#VALUE!	.		.		#VALUE!
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.6		8.4	.		.		#VALUE!	.		.		#VALUE!
12800 - 7417 - WESLEY ST @ LYNN ST	0		6.4		2	.		.		#VALUE!	.		.		#VALUE!
13200 - 7412 - LYNN ST @ BEACH ST	0		0.5	2	-0.5	.		.		#VALUE!	.		.		#VALUE!
Maximum					39.7					#VALUE!					#VALUE!
Total	45.8		46			43		43			25.3		43.7		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	21:45 (109.0) [14] !Fall 2012!					22:00 (109.1) [3] !Fall 2012!					22:30 (109.1) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	39.7		0		39.7	37		0		37	35.7		0		35.7
800 - 5504 - ALFORD ST @ MAIN ST	0.1		0.1		39.7	0		0		37	0		0		35.7
1200 - 5505 - 173 ALFORD ST	0	2	0.1		41.6	0	1	0		38	0	1	0		36.7
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		41.6	0		0		38	0		0.3		36.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.4		0.7		41.3	0.3		2		36.3	0		0		36.4
2400 - 5508 - BROADWAY @ LANGDON ST	0		0.1		41.2	0		0		36.3	0		0		36.4
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.1		0.4		40.9	0		0		36.3	0		0		36.4
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.3		1.6		39.6	0.7		3.3		33.7	0.3		2.7		34
3600 - 5695 - BROADWAY @ EVERETT SQ	1.1		3.6		37.1	0.3		3		31	0		6		28
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.2		1.6		35.7	0		3.7		27.3	1		6.3		22.7
4400 - 5511 - BROADWAY @ SUMMER ST	0.3		2.9		33.1	0		4		23.3	0		2.7		20
4800 - 5513 - BROADWAY @ HIGH ST	0.2		3.5		29.8	0		5		18.3	0		2.3		17.7
5200 - 5514 - BROADWAY @ LEXINGTON ST	0.1		1.1		28.8	0		2.7		15.6	0		2.7		15
5600 - 5517 - BROADWAY @ REED AVE	0.1		1.9		27	0		3.3		12.3	0		1.3		13.7
6000 - 5518 - BROADWAY @ FERRY ST	1.8		8.1		20.7	0		11.3	1	0	0		12.7	1	0
6400 - 5519 - BROADWAY @ COBURN TERR	0.4		0.9		20.2	.		.		#VALUE!	.		.		#VALUE!
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.3		0.8		19.7	.		.		#VALUE!	.		.		#VALUE!
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1.4		18.3	.		.		#VALUE!	.		.		#VALUE!
7600 - 5521 - BROADWAY @ LYNN ST	0.6		1.2		17.7	.		.		#VALUE!	.		.		#VALUE!
8000 - 5522 - BROADWAY @ SHUTE ST	0		0.6		17.1	.		.		#VALUE!	.		.		#VALUE!
8400 - 5523 - BROADWAY @ ESTES ST	0.1		2.5		14.7	.		.		#VALUE!	.		.		#VALUE!
8800 - 5524 - 53 BROADWAY	0.5		1.8		13.4	.		.		#VALUE!	.		.		#VALUE!
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		1.3		12.1	.		.		#VALUE!	.		.		#VALUE!
9600 - 5526 - 170 BROADWAY	0.1		0.1		12.1	.		.		#VALUE!	.		.		#VALUE!
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1.6		10.5	.		.		#VALUE!	.		.		#VALUE!
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		10.5	.		.		#VALUE!	.		.		#VALUE!
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.1		10.4	.		.		#VALUE!	.		.		#VALUE!
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		1.3		9.1	.		.		#VALUE!	.		.		#VALUE!
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.7		8.4	.		.		#VALUE!	.		.		#VALUE!
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0.9		7.5	.		.		#VALUE!	.		.		#VALUE!
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.6		6.9	.		.		#VALUE!	.		.		#VALUE!
12800 - 7417 - WESLEY ST @ LYNN ST	0		3.5		3.4	.		.		#VALUE!	.		.		#VALUE!
13200 - 7412 - LYNN ST @ BEACH ST	0		1.5	2	-0.1	.		.		#VALUE!	.		.		#VALUE!
Maximum					41.6					#VALUE!					#VALUE!
Total	46.3		46.3			38.3		38.3			37		37		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	22:45 (109.0) [2] !Fall 2012!					23:00 (109.1) [3] !Fall 2012!					23:30 (109.1) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOn	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	40		0		40	36.3		0		36.3	30.5		0		30.5
800 - 5504 - ALFORD ST @ MAIN ST	0		0		40	0		0		36.3	0		0		30.5
1200 - 5505 - 173 ALFORD ST	0	2	0		42	0	1	0		37.3	0	1	0		31.5
1600 - 5506 - BROADWAY @ DEXTER ST	0		1		41	0		0.3		37	0		0		31.5
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		1		40	0.7		1		36.7	0		0		31.5
2400 - 5508 - BROADWAY @ LANGDON ST	0		0.5		39.5	0		0.3		36.4	0.5		0		32
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		39.5	0.3		1.7		35	0		0		32
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		1		38.5	0.3		2.7		32.6	0		0		32
3600 - 5695 - BROADWAY @ EVERETT SQ	1		1.5		38	0.7		6		27.3	1		9.5		23.5
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		3		35	0		5.3		22	0		1.5		22
4400 - 5511 - BROADWAY @ SUMMER ST	0		1.5		33.5	0		0.3		21.7	0		0		22
4800 - 5513 - BROADWAY @ HIGH ST	0		1		32.5	0		8.3		13.4	0		8		14
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		4.5		28	0		4.3		9.1	0		1.5		12.5
5600 - 5517 - BROADWAY @ REED AVE	0		3		25	0		4.7		4.4	0		7.5		5
6000 - 5518 - BROADWAY @ FERRY ST	0		5.5		19.5	0		3.3	1	0.1	0		4	1	0
6400 - 5519 - BROADWAY @ COBURN TERR	0		0.5		19	.		.		#VALUE!	.		.		#VALUE!
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.5		0.5		19	.		.		#VALUE!	.		.		#VALUE!
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.5		18.5	.		.		#VALUE!	.		.		#VALUE!
7600 - 5521 - BROADWAY @ LYNN ST	0		1.5		17	.		.		#VALUE!	.		.		#VALUE!
8000 - 5522 - BROADWAY @ SHUTE ST	0		1.5		15.5	.		.		#VALUE!	.		.		#VALUE!
8400 - 5523 - BROADWAY @ ESTES ST	0		2		13.5	.		.		#VALUE!	.		.		#VALUE!
8800 - 5524 - 53 BROADWAY	0		1		12.5	.		.		#VALUE!	.		.		#VALUE!
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		12.5	.		.		#VALUE!	.		.		#VALUE!
9600 - 5526 - 170 BROADWAY	0		0		12.5	.		.		#VALUE!	.		.		#VALUE!
10000 - 5527 - EASTERN AVE @ BROADWAY	0		4.5		8	.		.		#VALUE!	.		.		#VALUE!
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		8	.		.		#VALUE!	.		.		#VALUE!
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		8	.		.		#VALUE!	.		.		#VALUE!
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		8	.		.		#VALUE!	.		.		#VALUE!
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		2		6	.		.		#VALUE!	.		.		#VALUE!
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		6	.		.		#VALUE!	.		.		#VALUE!
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		6	.		.		#VALUE!	.		.		#VALUE!
12800 - 7417 - WESLEY ST @ LYNN ST	0.5		3.5		3	.		.		#VALUE!	.		.		#VALUE!
13200 - 7412 - LYNN ST @ BEACH ST	0		0.5	2	0.5	.		.		#VALUE!	.		.		#VALUE!
Maximum					42					#VALUE!					#VALUE!
Total	42		41.5			38.3		38.3			32		32		

Massachusetts Bay Transportation Authority
Route 109
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	23:45 (109.0) [7] !Fall 2012!					25:05 (109.0) [12] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	28.6		0		28.9	26.4		0		26.4	1333.6	0	1333.9
800 - 5504 - ALFORD ST @ MAIN ST	0.4		0.1		29.3	0.2		0		26.6	27.3	2.2	1359.1
1200 - 5505 - 173 ALFORD ST	0	2	0		33.1	0	3	0		26.6	23.9	0.6	1483.2
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.1		33	0		0		26.6	1	12.8	1471.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.1		0.4		32.7	0.1		0		26.7	28.1	36.2	1463.3
2400 - 5508 - BROADWAY @ LANGDON ST	0		0.1		32.6	0		1.4		25.3	21	31.5	1452.8
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0.3		32.3	0		1.2		24.1	15.4	20.6	1447.6
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.3		2.1		30.4	0.3		1.2		23.3	32.6	78.6	1401.6
3600 - 5695 - BROADWAY @ EVERETT SQ	0.3		3.3		27.4	0.1		1.4		21.9	109.2	185.6	1325.1
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		1.7		25.7	0.3		1.3		20.9	52	76.7	1300.4
4400 - 5511 - BROADWAY @ SUMMER ST	0.4		2.9		23.3	0		2.8		18.2	30.3	62.9	1268
4800 - 5513 - BROADWAY @ HIGH ST	0.3		2		21.6	0		2		16.2	21.2	121.3	1167.9
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		2.4		19.1	0		1.1		15.1	15.5	87.6	1095.7
5600 - 5517 - BROADWAY @ REED AVE	0		1.1		18	0		1.8		13.3	14.5	86.1	1024.1
6000 - 5518 - BROADWAY @ FERRY ST	2.3		4.1		16.1	0		4.9		8.4	65	300.2	780.8
6400 - 5519 - BROADWAY @ COBURN TERR	0.1		0.1		16.1	0		0.3		8.2	15.3	25.5	#VALUE!
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.1		0.4		15.9	0.1		1		7.3	10.9	34.7	#VALUE!
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.3		15.6	0		0.7		6.6	3.7	27.7	#VALUE!
7600 - 5521 - BROADWAY @ LYNN ST	0		0.4		15.1	0		0.6		6	7.8	71.5	#VALUE!
8000 - 5522 - BROADWAY @ SHUTE ST	0		2.1		13	0		0.8		5.3	3.5	36.8	#VALUE!
8400 - 5523 - BROADWAY @ ESTES ST	0		0.1		12.9	0		0.2		5.1	3.2	59.8	#VALUE!
8800 - 5524 - 53 BROADWAY	0.1		0.7		12.3	0		0.6		4.5	9.6	88.9	#VALUE!
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		1.1		11.1	0		0.3		4.2	0.4	28.4	#VALUE!
9600 - 5526 - 170 BROADWAY	0		0		11.1	0		0		4.2	0.6	18.3	#VALUE!
10000 - 5527 - EASTERN AVE @ BROADWAY	0		3.1		8	0		0.5		3.7	2	76.2	#VALUE!
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		8	0		0		3.7	0.3	1.6	#VALUE!
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		8	0		0.2		3.5	0.2	8.3	#VALUE!
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		8	0		0.2		3.3	0	17.5	#VALUE!
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		1.7		6.3	0		0.5		2.8	0	23.5	#VALUE!
12000 - 5532 - EASTERN AVE @ LYNN ST	0		2		4.3	0		0.7		2.2	0.1	32.3	#VALUE!
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		4.3	0		1.4		0.8	6.8	16.5	#VALUE!
12800 - 7417 - WESLEY ST @ LYNN ST	0		1.9		2.4	0		0.9		0	9.7	158.4	#VALUE!
13200 - 7412 - LYNN ST @ BEACH ST	0		2	2	0.4	0		0	3	0	0	33.1	#VALUE!
Maximum					33.1					26.7	0	0	#VALUE!
Total	33.1		37			27.5		27.7			1838.6	1858.8	0

Massachusetts Bay Transportation Authority
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	05:20 (109.0) [2] !Fall 2012!					06:05 (109.0) [2] !Fall 2012!					06:45 (109.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	2.5	1	0		3.5	1.5	1	0		2.5	7.5	0	0		7.5
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		3.5	0		0		2.5	0.5		0		8
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		3.5	0		0		2.5	0		0		8
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		3.5	0		0		2.5	0		0		8
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	1.5		0		5	0		0		2.5	0		0		8
2400 - 5477 - 1236 EASTERN AVE	0		0		5	0		0		2.5	0		0		8
2800 - 5478 - BROADWAY @ EASTERN AVE	2		0		7	1		0		3.5	0		0		8
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		7	0.5		0		4	1.5		0		9.5
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0		0		7	1		0		5	2.5		0		12
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		7	1		0		6	1		0		13
4400 - 5483 - BROADWAY @ SHUTE ST	3.5		0		10.5	3		0		9	0		0		13
4800 - 5484 - BROADWAY @ CAMERON ST	4		0		14.5	1.5		0		10.5	4		0.5		16.5
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0		15	1		0		11.5	0.5		0		17
5600 - 5486 - BROADWAY @ EDITH AVE	0.5		0		15.5	1		0		12.5	0		0		17
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		15.5	2.5		0		15	0		0		17
6400 - 5488 - BROADWAY @ FERRY ST	1.5		0		17	3.5		3		15.5	6		0		23
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		17	2.5		0		18	0.5		0		23.5
7200 - 5490 - BROADWAY @ RAYMOND ST	0.5		0		17.5	3.5		0		21.5	1		2		22.5
7600 - 5492 - BROADWAY @ HANCOCK ST	1.5		0		19	3.5		0		25	3		0		25.5
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		19	0.5		0		25.5	0		0		25.5
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		19	0.5		0.5		25.5	2		0		27.5
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		19	0		0		25.5	0		0		27.5
9200 - 5496 - BROADWAY @ NORWOOD ST	4		1		22	7.5		0		33	3.5		2.5		28.5
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		22	1		0		34	0		0		28.5
10000 - 5560 - BROADWAY @ GLADSTONE ST	1		0		23	1.5		0		35.5	0.5		0		29
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		23	0		0		35.5	0		0		29
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.5		0		23.5	0		0		35.5	0		0		29
11200 - 5499 - BROADWAY OPP THORNDIKE ST	2		0.5		25	0.5		0		36	1		0		30
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		25	0		0		36	1		0		31
12000 - 5501 - OPP 173 ALFORD ST	0		0	1	24	0		0	1	35	0		0	0	31
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		24	0		0		35	0		0		31
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		24	0		0		35	0		0		31
13200 - 5502 - ALFORD ST @ WEST ST	0		0		24	0		0		35	0		0		31
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		24		0	0		35		0	0		31		0
Maximum					25					36					31
Total	25.5		25.5			38.5		38.5			36		36		

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Seq - StopID - Stop Name	07:45 (109.0) [2] !Fall 2012!					08:45 (109.0) [2] !Fall 2012!					09:45 (109.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	2.5	2	0		4.5	8.5	2	0		10.5	7	5	0		12
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		4.5	0.5		0		11	0		0		12
1200 - 5474 - EASTERN AVE @ CLAPP ST	1		0		5.5	0.5		0		11.5	0		0		12
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		5.5	1		0		12.5	0		0		12
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		5.5	0		0		12.5	0		0		12
2400 - 5477 - 1236 EASTERN AVE	0		0		5.5	0		0		12.5	0		0		12
2800 - 5478 - BROADWAY @ EASTERN AVE	0.5		0		6	2		0		14.5	2		0		14
3200 - 5480 - BROADWAY @ SHEAFE ST	1.5		0		7.5	0		0		14.5	1		0		15
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2		0		9.5	2.5		0.5		16.5	4.5		0.5		19
4000 - 5482 - 990 BROADWAY OPP GROVER ST	1.5		0.5		10.5	1.5		0		18	0.5		0		19.5
4400 - 5483 - BROADWAY @ SHUTE ST	1		0		11.5	1.5		0		19.5	1		0		20.5
4800 - 5484 - BROADWAY @ CAMERON ST	1.5		0		13	2		0.5		21	2.5		0		23
5200 - 5485 - BROADWAY @ KENWOOD RD	1		0		14	0.5		0.5		21	0.5		0		23.5
5600 - 5486 - BROADWAY @ EDITH AVE	1		0		15	1		0		22	0		0		23.5
6000 - 5487 - BROADWAY @ MARIE AVE	0.5		0		15.5	0		0		22	0		0.5		23
6400 - 5488 - BROADWAY @ FERRY ST	2		0		17.5	2.5		1.5		23	2.5		0		25.5
6800 - 5489 - BROADWAY @ WAVERLY AVE	1		0		18.5	0		0.5		22.5	1		0.5		26
7200 - 5490 - BROADWAY @ RAYMOND ST	3		0		21.5	2.5		0.5		24.5	2.5		0		28.5
7600 - 5492 - BROADWAY @ HANCOCK ST	4.5		0		26	2		1		25.5	1		0		29.5
8000 - 5493 - BROADWAY @ PLEASANT ST	1.5		0		27.5	1.5		1		26	3		0.5		32
8400 - 5494 - BROADWAY @ WEBSTER ST	1		0		28.5	1.5		0		27.5	0		0		32
8800 - 5495 - BROADWAY @ CHURCH ST	0.5		0		29	0		0.5		27	0		2.5		29.5
9200 - 5496 - BROADWAY @ NORWOOD ST	4.5		3		30.5	6		1		32	6.5		4		32
9600 - 5559 - BROADWAY OPP SECOND ST	0.5		0		31	1.5		0		33.5	0.5		0.5		32
10000 - 5560 - BROADWAY @ GLADSTONE ST	2		0.5		32.5	2		1.5		34	3		1		34
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		32.5	0		1		33	0.5		0		34.5
10800 - 5498 - BROADWAY OPP BEACHAM ST	1		0		33.5	0		0		33	0		0		34.5
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0.5		33	0.5		0		33.5	0.5		0		35
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		33	0		0		33.5	0		0		35
12000 - 5501 - OPP 173 ALFORD ST	0		0	2	31	0		0	2	31.5	0		0	5	30
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		31	0		0		31.5	0		0		30
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		31	0		0		31.5	0		0		30
13200 - 5502 - ALFORD ST @ WEST ST	0		0		31	0		0		31.5	0		0.5		29.5
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		31		0	0		31.5		0	0		29.5		0
Maximum					33.5					34					35
Total	35.5		35.5			41.5		41.5			40		40		

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	10:17 (109.0) [2] !Fall 2012!					10:52 (109.0) [2] !Fall 2012!					11:27 (109.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	3.5	4	0		7.5	10	3	0		13	9.5	7	0		16.5
800 - 5473 - EASTERN AVE @ LYNN ST	0.5		0		8	0		0		13	0.5		0.5		16.5
1200 - 5474 - EASTERN AVE @ CLAPP ST	0.5		0		8.5	1		0		14	0.5		0		17
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0.5		0		9	1		0		15	0		0		17
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		9	1		0		16	0		0		17
2400 - 5477 - 1236 EASTERN AVE	0		0		9	0		0		16	0		0		17
2800 - 5478 - BROADWAY @ EASTERN AVE	1		0		10	0.5		0		16.5	1		0		18
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		10	1		0.5		17	0		0		18
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	4.5		0.5		14	4.5		0		21.5	5		0		23
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.5		0		14.5	0		0		21.5	0		0		23
4400 - 5483 - BROADWAY @ SHUTE ST	2		0		16.5	0.5		0		22	0		0		23
4800 - 5484 - BROADWAY @ CAMERON ST	1		0		17.5	3.5		0		25.5	2.5		0		25.5
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0		18	0		0.5		25	3		0		28.5
5600 - 5486 - BROADWAY @ EDITH AVE	0.5		0		18.5	0		0		25	0		0		28.5
6000 - 5487 - BROADWAY @ MARIE AVE	0.5		0		19	0.5		4.5		21	1		2.5		27
6400 - 5488 - BROADWAY @ FERRY ST	2.5		1		20.5	6.5		2		25.5	2.5		2.5		27
6800 - 5489 - BROADWAY @ WAVERLY AVE	0.5		0.5		20.5	1		1		25.5	2		0.5		28.5
7200 - 5490 - BROADWAY @ RAYMOND ST	3.5		0.5		23.5	3.5		1		28	3.5		1		31
7600 - 5492 - BROADWAY @ HANCOCK ST	1		0.5		24	1		0.5		28.5	1		0.5		31.5
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		0		24.5	2		0		30.5	1		0.5		32
8400 - 5494 - BROADWAY @ WEBSTER ST	2		0.5		26	0		1		29.5	0		0		32
8800 - 5495 - BROADWAY @ CHURCH ST	0		0.5		25.5	1		3		27.5	0		1.5		30.5
9200 - 5496 - BROADWAY @ NORWOOD ST	7		2		30.5	4		4.5		27	6.5		2.5		34.5
9600 - 5559 - BROADWAY OPP SECOND ST	1.5		0		32	1		0.5		27.5	1		0		35.5
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.5		1		32.5	1		0		28.5	0.5		0.5		35.5
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0.5		32.5	0.5		0.5		28.5	0		0		35.5
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		2.5		30	0		0		28.5	0.5		0		36
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.5		0		30.5	0.5		0		29	0		0.5		35.5
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		30.5	0		0		29	0		0		35.5
12000 - 5501 - OPP 173 ALFORD ST	0		0	4	26.5	0		0	3	26	0		0	7	28.5
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		26.5	0		0		26	0		0		28.5
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		26.5	0		0		26	0		0		28.5
13200 - 5502 - ALFORD ST @ WEST ST	0		0		26.5	0		0		26	0		0		28.5
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		26.5		0	0		26		0	0		28.5		0
Maximum					32.5					30.5					36
Total	36.5		36.5			45.5		45.5			41.5		41.5		

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Seq - StopID - Stop Name	12:02 (109.0) [2] !Fall 2012!					12:37 (109.0) [2] !Fall 2012!					13:12 (109.0) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	5	4	0		9	3	4	0		7	9	4	0		13
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		9	0.5		0		7.5	0		0		13
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		9	0.5		0		8	0		0		13
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		9	0.5		0		8.5	0		0		13
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		9	0		0		8.5	2		0		15
2400 - 5477 - 1236 EASTERN AVE	0		0		9	0		0		8.5	0		0		15
2800 - 5478 - BROADWAY @ EASTERN AVE	1		0		10	0.5		0		9	0		0		15
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		10	0		0		9	0		0		15
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	4.5		0		14.5	1.5		0		10.5	7		2		20
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0.5		0		15	0		0		10.5	0		0		20
4400 - 5483 - BROADWAY @ SHUTE ST	1.5		0.5		16	1.5		0		12	0		0		20
4800 - 5484 - BROADWAY @ CAMERON ST	6.5		0.5		22	0		0		12	5		1		24
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0.5		22	0.5		0		12.5	0		0		24
5600 - 5486 - BROADWAY @ EDITH AVE	0.5		0		22.5	1		0		13.5	0		5		19
6000 - 5487 - BROADWAY @ MARIE AVE	0.5		0		23	0.5		0		14	2		2		19
6400 - 5488 - BROADWAY @ FERRY ST	7.5		1		29.5	4.5		0.5		18	8		3		24
6800 - 5489 - BROADWAY @ WAVERLY AVE	1		0.5		30	1		0		19	0		0		24
7200 - 5490 - BROADWAY @ RAYMOND ST	4.5		0		34.5	0.5		1.5		18	4		0		28
7600 - 5492 - BROADWAY @ HANCOCK ST	1		0		35.5	1		0.5		18.5	2		0		30
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		2.5		33.5	0		0		18.5	0		0		30
8400 - 5494 - BROADWAY @ WEBSTER ST	0.5		0		34	0		0		18.5	4		0		34
8800 - 5495 - BROADWAY @ CHURCH ST	1		1		34	1		0		19.5	0		3		31
9200 - 5496 - BROADWAY @ NORWOOD ST	12		1.5		44.5	6.5		1		25	6		2		35
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		44.5	0		0		25	1		0		36
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.5		3		43	0		0		25	7		0		43
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0		43.5	1.5		0.5		26	0		1		42
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.5		0.5		43.5	0		0		26	2		0		44
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		43.5	0.5		0		26.5	4		0		48
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		43.5	0		0		26.5	0		0		48
12000 - 5501 - OPP 173 ALFORD ST	0		0	4	39.5	0		0	4	22.5	0		0	4	44
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		39.5	0		0		22.5	0		0		44
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		39.5	0		0		22.5	0		0		44
13200 - 5502 - ALFORD ST @ WEST ST	0		0		39.5	0		0.5		22	0		0		44
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		39.5		0	0		22		0	0		44		0
Maximum					44.5					26.5					48
Total	51		51			26.5		26.5			63		63		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar)														
	13:47 (109.0) [3] !Fall 2012!					14:22 (109.0) [1] !Fall 2012!					14:57 (109.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	8.3	4	0		12.3	13	4	0		17	5.5	4	0		9.5
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		12.3	0		0		17	0		0		9.5
1200 - 5474 - EASTERN AVE @ CLAPP ST	1		0		13.3	0		0		17	0		0		9.5
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		13.3	0		0		17	0		0		9.5
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		13.3	0		0		17	0		0		9.5
2400 - 5477 - 1236 EASTERN AVE	0		0		13.3	0		0		17	0		0		9.5
2800 - 5478 - BROADWAY @ EASTERN AVE	3.3		0		16.6	1		0		18	0.5		0		10
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		16.6	0		0		18	0.5		0		10.5
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	6.7		0.3		23	5		1		22	5		0		15.5
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0.3		22.7	1		0		23	0.5		0		16
4400 - 5483 - BROADWAY @ SHUTE ST	1		0.7		23	0		0		23	0		0		16
4800 - 5484 - BROADWAY @ CAMERON ST	0.7		0.3		23.4	4		0		27	3		0.5		18.5
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		23.4	0		0		27	0		0		18.5
5600 - 5486 - BROADWAY @ EDITH AVE	1.3		0.3		24.4	0		0		27	0		0		18.5
6000 - 5487 - BROADWAY @ MARIE AVE	0.3		0		24.7	0		0		27	0		0		18.5
6400 - 5488 - BROADWAY @ FERRY ST	3.7		4.3		24.1	9		3		33	1.5		0.5		19.5
6800 - 5489 - BROADWAY @ WAVERLY AVE	1		0		25.1	2		0		35	0.5		0.5		19.5
7200 - 5490 - BROADWAY @ RAYMOND ST	4		0		29.1	5		3		37	2		0		21.5
7600 - 5492 - BROADWAY @ HANCOCK ST	3.3		1.7		30.7	4		1		40	0.5		0		22
8000 - 5493 - BROADWAY @ PLEASANT ST	2.7		0.3		33.1	1		0		41	1		0		23
8400 - 5494 - BROADWAY @ WEBSTER ST	0.7		0		33.8	0		0		41	1		0		24
8800 - 5495 - BROADWAY @ CHURCH ST	0.3		1.3		32.8	0		0		41	1		0.5		24.5
9200 - 5496 - BROADWAY @ NORWOOD ST	4		2.3		34.5	2		0		43	2		2		24.5
9600 - 5559 - BROADWAY OPP SECOND ST	2		0		36.5	1		0		44	1		1.5		24
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		0		36.5	3		2		45	1		0.5		24.5
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		36.5	0		0		45	0		0		24.5
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.7		2		35.2	0		0		45	0		0		24.5
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.3		0.3		35.2	0		0		45	0		0		24.5
11600 - 5500 - BROADWAY @ HORIZON WAY	0.3		0		35.5	0		0		45	0		0		24.5
12000 - 5501 - OPP 173 ALFORD ST	0		0	4	31.5	0		0	4	41	0		0	4	20.5
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		31.5	0		0		41	0		0		20.5
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0.3		31.2	0		0		41	0		0		20.5
13200 - 5502 - ALFORD ST @ WEST ST	0		0		31.2	0		0		41	0		0		20.5
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		31		0	0		41		0	0		20.5		0
Maximum					36.5					45					24.5
Total	45.7		45.7			51		51			26.5		26.5		

Massachusetts Bay Transportation Authority
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	[Observations]														
	15:32 (109.0) [1] !Fall 2012!					16:07 (109.0) [2] !Fall 2012!					16:42 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	6	8	0		14	6.5	4	0		10.5	13	4	0		17
800 - 5473 - EASTERN AVE @ LYNN ST	1		0		15	0		0		10.5	0		0		17
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		15	0		0		10.5	0		0		17
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	1		0		16	0		0		10.5	0		0		17
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		16	0		0		10.5	0		0		17
2400 - 5477 - 1236 EASTERN AVE	0		0		16	0		0		10.5	0		0		17
2800 - 5478 - BROADWAY @ EASTERN AVE	1		0		17	2		0		12.5	1		3		15
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		17	1.5		0		14	0		0		15
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	6		0		23	2.5		0		16.5	5		0		20
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		23	0		0.5		16	0		0		20
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		23	0		0.5		15.5	0		0		20
4800 - 5484 - BROADWAY @ CAMERON ST	0		0		23	4		0.5		19	3		1		22
5200 - 5485 - BROADWAY @ KENWOOD RD	3		0		26	0		0		19	0		0		22
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		26	0		0.5		18.5	0		2		20
6000 - 5487 - BROADWAY @ MARIE AVE	0		1		25	0		0		18.5	0		0		20
6400 - 5488 - BROADWAY @ FERRY ST	0		1		24	3.5		1		21	5		1		24
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		24	0.5		0		21.5	1		3		22
7200 - 5490 - BROADWAY @ RAYMOND ST	1		3		22	3		1.5		23	3		0		25
7600 - 5492 - BROADWAY @ HANCOCK ST	3		4		21	1.5		0.5		24	0		0		25
8000 - 5493 - BROADWAY @ PLEASANT ST	2		0		23	0		0.5		23.5	3		0		28
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		23	0		0.5		23	1		2		27
8800 - 5495 - BROADWAY @ CHURCH ST	1		0		24	0		0		23	0		2		25
9200 - 5496 - BROADWAY @ NORWOOD ST	4		1		27	2		1.5		23.5	2		1		26
9600 - 5559 - BROADWAY OPP SECOND ST	0		0		27	1		0		24.5	0		0		26
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		0		27	3.5		0		28	0		0		26
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		27	0.5		0		28.5	0		0		26
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		27	0		0		28.5	1		0		27
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		27	0.5		0		29	0		0		27
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		27	0		0		29	0		1		26
12000 - 5501 - OPP 173 ALFORD ST	0		0	8	19	0		0	4	25	0		0	4	22
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		19	0		0		25	0		0		22
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		19	0		0		25	0		0		22
13200 - 5502 - ALFORD ST @ WEST ST	0		0		19	0		0.5		24.5	0		0		22
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		19		0	0		24.5		0	0		24		0
Maximum					27					29					28
Total	29		29			32.5		32.5			38		40		

Massachusetts Bay Transportation Authority
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	17:15 (109.0) [1] !Fall 2012!					17:45 (109.0) [2] !Fall 2012!					18:15 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	4	3	0		7	4	3	0		7	6	3	0		9
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		7	0		0		7	0		0		9
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		7	0		0		7	0		0		9
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		7	0		0		7	3		0		12
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		7	0		0		7	1		0		13
2400 - 5477 - 1236 EASTERN AVE	0		0		7	0		0		7	0		0		13
2800 - 5478 - BROADWAY @ EASTERN AVE	1		0		8	2		0.5		8.5	1		0		14
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		8	1.5		0		10	0		0		14
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2		0		10	4		1		13	2		0		16
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		10	0.5		0		13.5	0		0		16
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		10	0		0.5		13	0		1		15
4800 - 5484 - BROADWAY @ CAMERON ST	3		0		13	0		1.5		11.5	0		0		15
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		13	0.5		0		12	1		0		16
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		13	0		0		12	0		0		16
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		13	0		0		12	0		0		16
6400 - 5488 - BROADWAY @ FERRY ST	2		3		12	0.5		0.5		12	0		1		15
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		12	0.5		0		12.5	0		0		15
7200 - 5490 - BROADWAY @ RAYMOND ST	0		0		12	1.5		0		14	0		0		15
7600 - 5492 - BROADWAY @ HANCOCK ST	0		0		12	3		0		17	0		0		15
8000 - 5493 - BROADWAY @ PLEASANT ST	0		0		12	0		0		17	0		0		15
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		12	0.5		1		16.5	0		3		12
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		12	0		0		16.5	0		3		9
9200 - 5496 - BROADWAY @ NORWOOD ST	4		0		16	1.5		2.5		15.5	0		2		7
9600 - 5559 - BROADWAY OPP SECOND ST	2		2		16	0		0		15.5	0		0		7
10000 - 5560 - BROADWAY @ GLADSTONE ST	0		1		15	0.5		0.5		15.5	0		1		6
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0		15	0		0.5		15	0		0		6
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		15	0		0		15	0		0		6
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		15	0		0		15	0		0		6
11600 - 5500 - BROADWAY @ HORIZON WAY	1		0		16	0		0		15	0		0		6
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	13	0		0	3	12	0		0	3	3
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		13	0		0		12	0		0		3
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		13	0		0		12	0		0		3
13200 - 5502 - ALFORD ST @ WEST ST	0		1		12	0		0		12	0		0		3
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		15		0	0		12		0	0		3		0
Maximum					16					17					16
Total	19		22			20.5		20.5			14		14		

Massachusetts Bay Transportation Authority
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	18:45 (109.0) [2] !Fall 2012!					19:15 (109.0) [1] !Fall 2012!					20:00 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	5.5	2	0		7.5	5	8	0		13	17	4	0		21
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		7.5	0		0		13	1		0		22
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		7.5	0		0		13	0		0		22
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		7.5	0		0		13	0		0		22
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		7.5	0		0		13	0		0		22
2400 - 5477 - 1236 EASTERN AVE	0		0		7.5	0		0		13	0		0		22
2800 - 5478 - BROADWAY @ EASTERN AVE	0.5		0		8	3		1		15	0		0		22
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0.5		7.5	0		0		15	0		0		22
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	0.5		0		8	2		0		17	5		2		25
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		8	0		0		17	0		0		25
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		8	0		0		17	3		0		28
4800 - 5484 - BROADWAY @ CAMERON ST	1		0		9	0		0		17	1		0		29
5200 - 5485 - BROADWAY @ KENWOOD RD	0.5		0		9.5	0		0		17	0		0		29
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		9.5	0		0		17	2		0		31
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		9.5	0		2		15	0		0		31
6400 - 5488 - BROADWAY @ FERRY ST	1		1		9.5	4		0		19	1		1		31
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		9.5	2		0		21	0		0		31
7200 - 5490 - BROADWAY @ RAYMOND ST	1		0		10.5	1		1		21	1		0		32
7600 - 5492 - BROADWAY @ HANCOCK ST	2		0.5		12	3		1		23	1		1		32
8000 - 5493 - BROADWAY @ PLEASANT ST	1.5		0.5		13	2		0		25	0		2		30
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		13	1		0		26	0		0		30
8800 - 5495 - BROADWAY @ CHURCH ST	0		0		13	0		0		26	0		3		27
9200 - 5496 - BROADWAY @ NORWOOD ST	1		0		14	6		0		32	4		0		31
9600 - 5559 - BROADWAY OPP SECOND ST	0		2.5		11.5	0		1		31	4		0		35
10000 - 5560 - BROADWAY @ GLADSTONE ST	1		0		12.5	0		0		31	1		1		35
10400 - 5497 - BROADWAY @ BOWDOIN ST	0		0.5		12	0		2		29	0		0		35
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		0		12	0		1		28	0		1		34
11200 - 5499 - BROADWAY OPP THORNDIKE ST	1		0		13	0		0		28	0		0		34
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		13	0		0		28	1		0		35
12000 - 5501 - OPP 173 ALFORD ST	0		0	2	11	0		0	8	20	0		0	4	31
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		11	0		0		20	0		0		31
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		11	0		0		20	0		0		31
13200 - 5502 - ALFORD ST @ WEST ST	0		0		11	0		0		20	0		6		25
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		11		0	0		20		0	0		26		0
Maximum					14					32					35
Total	16.5		16.5			29		29			42		43		

Massachusetts Bay Transportation Authority
Route 109
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	20:50 (109.0) [2] !Winter 2013!					21:40 (109.0) [2] !Winter 2013!					22:30 (109.0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	8.5	3	0		11.5	3.5	9	0		12.5	3	8	0		11
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		11.5	0		0		12.5	0		0		11
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		11.5	0		0		12.5	0		0		11
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		11.5	0		0		12.5	0		0		11
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		11.5	0		0		12.5	0		0		11
2400 - 5477 - 1236 EASTERN AVE	0		0		11.5	0		0		12.5	0		0		11
2800 - 5478 - BROADWAY @ EASTERN AVE	0		0		11.5	0.5		0		13	0.6		0		11.6
3200 - 5480 - BROADWAY @ SHEAFE ST	0		0		11.5	0		0		13	0		0		11.6
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	2.5		0		14	1.5		0		14.5	2		0.2		13.4
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		14	0		0		14.5	0		0		13.4
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		14	0		0		14.5	0.8		0.2		14
4800 - 5484 - BROADWAY @ CAMERON ST	0		0		14	4		1		17.5	1		0		15
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		14	0		0		17.5	0.2		0		15.2
5600 - 5486 - BROADWAY @ EDITH AVE	1		0		15	0		0.5		17	0.6		0.2		15.6
6000 - 5487 - BROADWAY @ MARIE AVE	0		1		14	1.5		0		18.5	0		0		15.6
6400 - 5488 - BROADWAY @ FERRY ST	3		1.5		15.5	2		0		20.5	2.2		1.2		16.6
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		15.5	3		0.5		23	0		0.2		16.4
7200 - 5490 - BROADWAY @ RAYMOND ST	1.5		0.5		16.5	1.5		2		22.5	0.8		0		17.2
7600 - 5492 - BROADWAY @ HANCOCK ST	1		0.5		17	3		0.5		25	1		0		18.2
8000 - 5493 - BROADWAY @ PLEASANT ST	0.5		0		17.5	2.5		0.5		27	0.4		1.6		17
8400 - 5494 - BROADWAY @ WEBSTER ST	2.5		0		20	0		0		27	0		0		17
8800 - 5495 - BROADWAY @ CHURCH ST	0		1		19	0		0		27	0.2		0.8		16.4
9200 - 5496 - BROADWAY @ NORWOOD ST	6		2		23	2		1		28	2.4		0.2		18.6
9600 - 5559 - BROADWAY OPP SECOND ST	2		0.5		24.5	0		0		28	0		0		18.6
10000 - 5560 - BROADWAY @ GLADSTONE ST	1.5		1.5		24.5	0.5		0		28.5	0.2		0		18.8
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.5		0		25	0		0		28.5	0		0		18.8
10800 - 5498 - BROADWAY OPP BEACHAM ST	0		1.5		23.5	0		0		28.5	0.2		0		19
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0.5		0		24	0.5		0		29	0.2		0.6		18.6
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		24	0.5		0		29.5	0		0.4		18.2
12000 - 5501 - OPP 173 ALFORD ST	0		0	3	21	0		0	9	20.5	0		0	8	10.2
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		21	0		0		20.5	0		0		10.2
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		21	0		0		20.5	0		0		10.2
13200 - 5502 - ALFORD ST @ WEST ST	0.5		0		21.5	0		0		20.5	0		0		10.2
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		22.5		25	0		20.5		0	0		10.6		0
Maximum					25					29.5					19
Total	31.5		32.5			26.5		26.5			15.8		16.2		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	23:20 (109.0) [4] !Fall 2012!					24:10 (109.0) [4] !Fall 2012!					Total				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 7412 - LYNN ST @ BEACH ST	5.5	7	0		12.5	3	5	0		8	186.8		0		186.8
800 - 5473 - EASTERN AVE @ LYNN ST	0		0		12.5	0.3		0		8.3	4.8		0.5		191.1
1200 - 5474 - EASTERN AVE @ CLAPP ST	0		0		12.5	0		0		8.3	5		0		196.1
1600 - 5475 - 1388 EASTERN AVE OPP BELLVALE	0		0		12.5	0		0		8.3	7		0		203.1
2000 - 5476 - 1332 EASTERN AVE OPP PRENTISS	0		0		12.5	0		0		8.3	5.5		0		208.6
2400 - 5477 - 1236 EASTERN AVE	0		0		12.5	0		0		8.3	0		0		208.6
2800 - 5478 - BROADWAY @ EASTERN AVE	0.5		0		13	2		0.3		10	31.4		4.8		235.2
3200 - 5480 - BROADWAY @ SHEAFE ST	0.8		0.3		13.5	0.5		0		10.5	10.3		1.3		244.2
3600 - 5481 - BROADWAY @ BROADWAY PLAZA	1		0		14.5	0		0		10.5	92.2		8		328.4
4000 - 5482 - 990 BROADWAY OPP GROVER ST	0		0		14.5	0		0		10.5	8.5		1.3		335.6
4400 - 5483 - BROADWAY @ SHUTE ST	0		0		14.5	0		0.3		10.2	20.3		3.7		352.2
4800 - 5484 - BROADWAY @ CAMERON ST	0.5		1		14	0		0		10.2	59.2		8.3		403.1
5200 - 5485 - BROADWAY @ KENWOOD RD	0		0		14	0		0		10.2	13.7		1.5		415.3
5600 - 5486 - BROADWAY @ EDITH AVE	0		0		14	0		0		10.2	10.4		8.5		417.2
6000 - 5487 - BROADWAY @ MARIE AVE	0		0		14	0		0		10.2	9.8		13.5		413.5
6400 - 5488 - BROADWAY @ FERRY ST	0		0.8		13.2	0.3		1.8		8.7	88.2		37.1		464.6
6800 - 5489 - BROADWAY @ WAVERLY AVE	0		0		13.2	0.3		0		9	21.3		7.7		478.2
7200 - 5490 - BROADWAY @ RAYMOND ST	0.5		0.3		13.4	0.5		1		8.5	59.8		18.8		519.2
7600 - 5492 - BROADWAY @ HANCOCK ST	0.5		0.3		13.6	0		0		8.5	49.3		14		554.5
8000 - 5493 - BROADWAY @ PLEASANT ST	0.3		0.3		13.6	0.3		1		7.8	27.7		11.2		571
8400 - 5494 - BROADWAY @ WEBSTER ST	0		0		13.6	0		0		7.8	18.2		8.5		580.7
8800 - 5495 - BROADWAY @ CHURCH ST	0		0.5		13.1	0		0.3		7.5	6		24.4		562.3
9200 - 5496 - BROADWAY @ NORWOOD ST	1.3		0.5		13.9	0.8		0.5		7.8	119		41.5		639.8
9600 - 5559 - BROADWAY OPP SECOND ST	0.5		0.5		13.9	0.3		0		8.1	21.8		9		652.6
10000 - 5560 - BROADWAY @ GLADSTONE ST	0.3		1		13.2	0		0		8.1	34		16		670.6
10400 - 5497 - BROADWAY @ BOWDOIN ST	0.3		0		13.5	0.5		0.3		8.3	5.3		6.8		669.1
10800 - 5498 - BROADWAY OPP BEACHAM ST	0.3		0.3		13.5	0		0		8.3	6.7		8.8		667
11200 - 5499 - BROADWAY OPP THORNDIKE ST	0		0		13.5	0		0		8.3	13		2.4		677.6
11600 - 5500 - BROADWAY @ HORIZON WAY	0		0		13.5	0		0		8.3	3.8		1.4		680
12000 - 5501 - OPP 173 ALFORD ST	0		0	7	6.5	0		0	5	3.3	0		0		680
12400 - 55011 - ALFORD ST @ MWRA PUMP STATION	0		0		6.5	0		0		3.3	0		0		680
12800 - 55012 - ALFORD ST @ MBTA CHARLESTOWN	0		0		6.5	0		0		3.3	0		0.3		679.7
13200 - 5502 - ALFORD ST @ WEST ST	0		0		6.5	0		0		3.3	0.5		8.5		671.7
13600 - 2874 - SULLIVAN STATION - UPPER BUSW	0		6.5		0	0		3.3		0	0		678.9		0
Maximum					14.5					10.5	0		0		831
Total	12		12			8.5		8.5			939		946.4		0

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	04:55 (109.0) [2] !Fall 2012!					05:40 (109.0) [2] !Fall 2012!					06:25 (109.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	2		0		2	3.5		0		3.5	7		0		7
800 - 5504 - ALFORD ST @ MAIN ST	0		0		2	0		0		3.5	0		0		7
1200 - 5505 - 173 ALFORD ST	0	0	0		2	0	0	0		3.5	0	2	0		9
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		2	0		0		3.5	0		0		9
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		2	0		2		1.5	0		0		9
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		2	1		0		2.5	0		0.5		8.5
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		2	0		0		2.5	0		0		8.5
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0.5		1.5	0		0.5		2	0.5		0		9
3600 - 5695 - BROADWAY @ EVERETT SQ	0		0		1.5	1		0		3	0.5		0.5		9
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0		1.5	0		0		3	1		0		10
4400 - 5511 - BROADWAY @ SUMMER ST	0		0		1.5	0		0		3	0		0.5		9.5
4800 - 5513 - BROADWAY @ HIGH ST	0		0		1.5	0		0		3	0		1		8.5
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0		1.5	0		0		3	0		0		8.5
5600 - 5517 - BROADWAY @ REED AVE	0		0		1.5	0		0		3	0		0.5		8
6000 - 5518 - BROADWAY @ FERRY ST	0		0		1.5	1.5		0		4.5	1		1.5		7.5
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		1.5	0		0		4.5	0		0		7.5
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		1.5	0		0		4.5	0		0		7.5
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		1.5	0		0		4.5	0		0		7.5
7600 - 5521 - BROADWAY @ LYNN ST	0		0		1.5	0		1		3.5	0		0		7.5
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		1.5	0		0		3.5	0		0		7.5
8400 - 5523 - BROADWAY @ ESTES ST	0		0		1.5	0		0		3.5	0		0		7.5
8800 - 5524 - 53 BROADWAY	0		0		1.5	0		0		3.5	0		0		7.5
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		1.5	0		0		3.5	0		1.5		6
9600 - 5526 - 170 BROADWAY	0		0		1.5	0		0		3.5	0		0		6
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0		1.5	0		1		2.5	0		1		5
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		1.5	0		0		2.5	0		0		5
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		1.5	0		0		2.5	0		0		5
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.5		1	0		0		2.5	0		1		4
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		1	0		0		2.5	0		0		4
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		1	0		0		2.5	0		0		4
12400 - 7413 - BEACH ST @ HANCOCK RD	2		2		1	0		0		2.5	0		0		4
12800 - 7417 - WESLEY ST @ LYNN ST	0		0		1	0.5		2		1	0		1.5		2.5
13200 - 7412 - LYNN ST @ BEACH ST	0		1	0	0	0		1	0	0	0		0.5	2	0
Maximum					2					4.5					10
Total	4		4			7.5		7.5			10		10		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
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	07:15 (109.0) [2] !Fall 2012!					08:15 (109.0) [2] !Fall 2012!					09:15 (109.0) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	15.5		0		15.5	16		0		16	16.5		0		16.5
800 - 5504 - ALFORD ST @ MAIN ST	0		0		15.5	0		0		16	0		0		16.5
1200 - 5505 - 173 ALFORD ST	0	3	0		18.5	0	4	0.5		19.5	0	5	0		21.5
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		18.5	0		0		19.5	0		0		21.5
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.5		0		19	0		0		19.5	0		0		21.5
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		19	0		2		17.5	0.5		1		21
2800 - 5509 - BROADWAY ST @ BARTLETT ST	1		0		20	0		0		17.5	0.5		0		21.5
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0.5		19.5	0		0.5		17	1		2		20.5
3600 - 5695 - BROADWAY @ EVERETT SQ	0		0.5		19	5.5		1		21.5	0		2.5		18
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0.5		18.5	3		2		22.5	1		0		19
4400 - 5511 - BROADWAY @ SUMMER ST	0.5		0.5		18.5	0		0.5		22	0		2		17
4800 - 5513 - BROADWAY @ HIGH ST	0		2.5		16	0		0		22	0.5		0		17.5
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		1		15	0		0		22	0.5		0		18
5600 - 5517 - BROADWAY @ REED AVE	0		2		13	0.5		0		22.5	1		0		19
6000 - 5518 - BROADWAY @ FERRY ST	2		2		13	2		3		21.5	1.5		4		16.5
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		13	0		0		21.5	1		0		17.5
6800 - 5515 - BROADWAY @ GLEDHILL ST	1.5		1		13.5	0		0.5		21	0		0		17.5
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		13.5	0		0		21	0		0		17.5
7600 - 5521 - BROADWAY @ LYNN ST	0		0		13.5	0		1		20	0.5		1		17
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		13.5	0		0		20	0		0.5		16.5
8400 - 5523 - BROADWAY @ ESTES ST	0		1		12.5	0		2		18	0		0.5		16
8800 - 5524 - 53 BROADWAY	0		0		12.5	0		0.5		17.5	0		2.5		13.5
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		12.5	0		1		16.5	0		0		13.5
9600 - 5526 - 170 BROADWAY	0		0		12.5	0		0		16.5	0		0.5		13
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0		12.5	0		2.5		14	0		0.5		12.5
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		12.5	0		0		14	0		0		12.5
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		12.5	0		0		14	0		1		11.5
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		12.5	0		0		14	0		0.5		11
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		12.5	0		1.5		12.5	0		0		11
12000 - 5532 - EASTERN AVE @ LYNN ST	0		1.5		11	0		2		10.5	0		0		11
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0.5		10.5	0		0		10.5	0		0		11
12800 - 7417 - WESLEY ST @ LYNN ST	0		7.5		3	0		6.5		4	0		5		6
13200 - 7412 - LYNN ST @ BEACH ST	0		0	3	0	0		0	4	0	0		1	5	0
Maximum					20					22.5					21.5
Total	21		21			27		27			24.5		24.5		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	09:45 (109.0) [2] !Fall 2012!					10:17 (109.0) [2] !Fall 2012!					10:52 (109.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	17		0		17	18		0		18	5.5		0		5.5
800 - 5504 - ALFORD ST @ MAIN ST	0		1		16	0		0		18	0		0		5.5
1200 - 5505 - 173 ALFORD ST	0	4	0		20	0	5	0		23	0	5	0		10.5
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		20	0		0		23	0		0		10.5
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		20	0.5		0		23.5	0		0		10.5
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		20	0		0.5		23	0		0		10.5
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		20	0		0		23	0		0		10.5
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0		20	0		0		23	2.5		0.5		12.5
3600 - 5695 - BROADWAY @ EVERETT SQ	2		1.5		20.5	2.5		4		21.5	4		1.5		15
4000 - 5510 - BROADWAY @ MANSFIELD ST	0.5		1		20	3.5		0		25	1		0		16
4400 - 5511 - BROADWAY @ SUMMER ST	0.5		0.5		20	0.5		3.5		22	1.5		0.5		17
4800 - 5513 - BROADWAY @ HIGH ST	0		0.5		19.5	0.5		1.5		21	1.5		0		18.5
5200 - 5514 - BROADWAY @ LEXINGTON ST	1		1		19.5	0		0		21	1		0		19.5
5600 - 5517 - BROADWAY @ REED AVE	0		1		18.5	0		0.5		20.5	0		1		18.5
6000 - 5518 - BROADWAY @ FERRY ST	0		3		15.5	4.5		3.5		21.5	0.5		3.5		15.5
6400 - 5519 - BROADWAY @ COBURN TERR	0.5		0.5		15.5	0		0		21.5	1.5		0		17
6800 - 5515 - BROADWAY @ GLEDHILL ST	0.5		1.5		14.5	0.5		0.5		21.5	0		0.5		16.5
7200 - 5520 - BROADWAY @ SUMMIT AVE	0.5		0.5		14.5	0.5		1		21	0		1		15.5
7600 - 5521 - BROADWAY @ LYNN ST	0		0		14.5	0		0.5		20.5	0.5		1		15
8000 - 5522 - BROADWAY @ SHUTE ST	0		0.5		14	0		1		19.5	0.5		0.5		15
8400 - 5523 - BROADWAY @ ESTES ST	0		1		13	0		0.5		19	0		0		15
8800 - 5524 - 53 BROADWAY	0.5		2		11.5	0.5		3.5		16	0		2.5		12.5
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0.5		11	0		1		15	0		0		12.5
9600 - 5526 - 170 BROADWAY	0		1		10	0		0.5		14.5	0		0.5		12
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		9	0		2		12.5	0		0.5		11.5
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		9	0		0		12.5	0		0		11.5
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		9	0		0		12.5	0		0		11.5
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		9	0		0		12.5	0		0		11.5
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		1		8	0		0		12.5	0		0.5		11
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		8	0		0		12.5	0		0		11
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		8	0		0		12.5	0		1.5		9.5
12800 - 7417 - WESLEY ST @ LYNN ST	0		2		6	0		5.5		7	0		2.5		7
13200 - 7412 - LYNN ST @ BEACH ST	0		2	4	0	0		2	5	0	0		2	5	0
Maximum					20.5					25					19.5
Total	23		23			31.5		31.5			20		20		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:27 (109.0) [2] !Fall 2012!					12:02 (109.0) [2] !Fall 2012!					12:37 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	25.5		0		25.5	19.5		0		19.5	26		0		26
800 - 5504 - ALFORD ST @ MAIN ST	0.5		0		26	0		0		19.5	0		0		26
1200 - 5505 - 173 ALFORD ST	0	9	0		35	0	5	0		24.5	0	5	0		31
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		35	0		0		24.5	0		0		31
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		35	0		0.5		24	0		0		31
2400 - 5508 - BROADWAY @ LANGDON ST	0		2		33	0.5		1		23.5	0		0		31
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		33	0		0		23.5	0		5		26
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.5		1.5		32	0.5		1		23	0		0		26
3600 - 5695 - BROADWAY @ EVERETT SQ	7		3.5		35.5	3.5		2.5		24	0		0		26
4000 - 5510 - BROADWAY @ MANSFIELD ST	3.5		1.5		37.5	4.5		1		27.5	1		0		27
4400 - 5511 - BROADWAY @ SUMMER ST	2.5		0.5		39.5	0		0.5		27	5		2		30
4800 - 5513 - BROADWAY @ HIGH ST	1		0.5		40	1		3.5		24.5	1		3		28
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		3		37	0		2		22.5	0		3		25
5600 - 5517 - BROADWAY @ REED AVE	1.5		1.5		37	0		0		22.5	0		2		23
6000 - 5518 - BROADWAY @ FERRY ST	2		6.5		32.5	0.5		3.5		19.5	0		5		18
6400 - 5519 - BROADWAY @ COBURN TERR	2		1		33.5	0.5		0		20	1		1		18
6800 - 5515 - BROADWAY @ GLEDHILL ST	1		0.5		34	0		0.5		19.5	0		0		18
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		34	1		0.5		20	0		0		18
7600 - 5521 - BROADWAY @ LYNN ST	0		1		33	1		1		20	0		0		18
8000 - 5522 - BROADWAY @ SHUTE ST	0		0.5		32.5	0		1		19	0		4		14
8400 - 5523 - BROADWAY @ ESTES ST	0.5		0.5		32.5	0		0		19	0		1		13
8800 - 5524 - 53 BROADWAY	0		5		27.5	2		3.5		17.5	0		2		11
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		27.5	0		0		17.5	0		0		11
9600 - 5526 - 170 BROADWAY	0		1.5		26	0		1.5		16	0		0		11
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		25	0		0		16	0		2		9
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		25	0		0		16	0		0		9
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.5		24.5	0		0		16	0		0		9
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		24.5	0		0		16	0		0		9
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		24.5	0		2		14	0		0		9
12000 - 5532 - EASTERN AVE @ LYNN ST	0		1		23.5	0		0		14	0		0		9
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		23.5	0		0		14	0		2		7
12800 - 7417 - WESLEY ST @ LYNN ST	0		14.5		9	0		6.5		7.5	0		2		5
13200 - 7412 - LYNN ST @ BEACH ST	0		0	9	0	0		2.5	5	0	0		0	5	0
Maximum					40					27.5					31
Total	47.5		47.5			34.5		34.5			34		34		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	13:12 (109.0) [2] !Fall 2012!					13:47 (109.0) [1] !Fall 2012!					14:22 (109.0) [2] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	18.5		0		18.5	18		0		18	30.5		0		30.5
800 - 5504 - ALFORD ST @ MAIN ST	0		0		18.5	2		0		20	0		0		30.5
1200 - 5505 - 173 ALFORD ST	0	5	0		23.5	0	4	0		24	0	4	0		34.5
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		23.5	0		0		24	0		0		34.5
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.5		23	1		1		24	0		0		34.5
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		23	0		3		21	2		1		35.5
2800 - 5509 - BROADWAY ST @ BARTLETT ST	1		0		24	0		0		21	0		0		35.5
3200 - 5565 - BROADWAY @ GLADSTONE ST	2		0		26	0		1		20	1		2		34.5
3600 - 5695 - BROADWAY @ EVERETT SQ	2		4		24	3		0		23	2.5		1.5		35.5
4000 - 5510 - BROADWAY @ MANSFIELD ST	2.5		1.5		25	0		0		23	1		4		32.5
4400 - 5511 - BROADWAY @ SUMMER ST	0.5		0		25.5	2		1		24	0.5		1		32
4800 - 5513 - BROADWAY @ HIGH ST	0		0		25.5	0		0		24	1.5		5.5		28
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		0.5		25	0		3		21	0		1.5		26.5
5600 - 5517 - BROADWAY @ REED AVE	0.5		0		25.5	0		3		18	0		0.5		26
6000 - 5518 - BROADWAY @ FERRY ST	1.5		3		24	5		5		18	3.5		7		22.5
6400 - 5519 - BROADWAY @ COBURN TERR	0		0.5		23.5	0		0		18	1		0.5		23
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		23.5	0		0		18	0		1		22
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.5		23	0		0		18	0		1.5		20.5
7600 - 5521 - BROADWAY @ LYNN ST	0		1		22	0		1		17	1.5		0		22
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		22	0		0		17	0		2.5		19.5
8400 - 5523 - BROADWAY @ ESTES ST	0		0		22	0		0		17	0		0		19.5
8800 - 5524 - 53 BROADWAY	0		4.5		17.5	0		5		12	0		2		17.5
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		17.5	0		0		12	0		0.5		17
9600 - 5526 - 170 BROADWAY	0		0.5		17	0		0		12	0		0		17
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0		17	1		2		11	0		0.5		16.5
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		17	0		0		11	0		0		16.5
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		1		16	0		0		11	0		0		16.5
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		16	0		0		11	0		0		16.5
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		16	0		2		9	0		0		16.5
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		16	0		2		7	0		0.5		16
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		16	0		0		7	0		0		16
12800 - 7417 - WESLEY ST @ LYNN ST	0		10		6	0		3		4	0		9		7
13200 - 7412 - LYNN ST @ BEACH ST	0		1	5	0	0		0	4	0	0		3	4	0
Maximum					26					24					35.5
Total	28.5		28.5			32		32			45		45		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
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	Trip (RouteVar) [Observations]														
	14:57 (109.0) [1] !Fall 2012!					15:32 (109.0) [2] !Fall 2012!					16:07 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	31		0		31	24		0		24	24		0		24
800 - 5504 - ALFORD ST @ MAIN ST	0		0		31	0		0		24	2		0		26
1200 - 5505 - 173 ALFORD ST	0	5	0		36	0	8	0		32	0	4	0		30
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		36	0		0		32	0		0		30
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		36	0.5		0		32.5	0		0		30
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		36	0		0.5		32	0		0		30
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		36	0		0		32	0		0		30
3200 - 5565 - BROADWAY @ GLADSTONE ST	1		0		37	0		2.5		29.5	0		2		28
3600 - 5695 - BROADWAY @ EVERETT SQ	1		3		35	1.5		1.5		29.5	1		3		26
4000 - 5510 - BROADWAY @ MANSFIELD ST	2		5		32	1		0.5		30	4		0		30
4400 - 5511 - BROADWAY @ SUMMER ST	0		2		30	1		1.5		29.5	3		2		31
4800 - 5513 - BROADWAY @ HIGH ST	0		1		29	2.5		1		31	0		4		27
5200 - 5514 - BROADWAY @ LEXINGTON ST	2		4		27	0.5		1.5		30	0		0		27
5600 - 5517 - BROADWAY @ REED AVE	0		1		26	0		0		30	0		3		24
6000 - 5518 - BROADWAY @ FERRY ST	2		13		15	3.5		3.5		30	2		7		19
6400 - 5519 - BROADWAY @ COBURN TERR	0		1		14	1		1		30	0		4		15
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0		14	0		1.5		28.5	0		2		13
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0		14	0		2		26.5	0		0		13
7600 - 5521 - BROADWAY @ LYNN ST	0		0		14	0.5		4.5		22.5	0		3		10
8000 - 5522 - BROADWAY @ SHUTE ST	0		1		13	0		0.5		22	0		1		9
8400 - 5523 - BROADWAY @ ESTES ST	0		0		13	0		2.5		19.5	0		1		8
8800 - 5524 - 53 BROADWAY	0		0		13	0.5		2.5		17.5	1		1		8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		13	0		0		17.5	0		0		8
9600 - 5526 - 170 BROADWAY	0		1		12	0		0		17.5	0		0		8
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		11	0		2		15.5	0		0		8
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		11	0		0		15.5	0		0		8
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		11	0		0		15.5	0		0		8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		1		10	0		0.5		15	0		0		8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		1		9	0		1		14	0		0		8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		2		7	0		0		14	0		0		8
12400 - 7413 - BEACH ST @ HANCOCK RD	0		1		6	0		0		14	0		0		8
12800 - 7417 - WESLEY ST @ LYNN ST	0		1		5	0		5.5		8.5	2		4		6
13200 - 7412 - LYNN ST @ BEACH ST	0		0	5	0	0		0.5	8	0	0		0	4	2
Maximum					37					32.5					31
Total	39		39			36.5		36.5			39		37		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
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(Urban Transportation Associates)

	16:42 (109.0) [1] !Fall 2012!					17:15 (109.0) [1] !Fall 2012!					17:45 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	27		0		27	24		0		24	33		0		33
800 - 5504 - ALFORD ST @ MAIN ST	0		0		27	0		0		24	0		0		33
1200 - 5505 - 173 ALFORD ST	0	4	0		31	0	3	0		27	0	3	0		36
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		31	0		0		27	0		1		35
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0		31	0		5		22	0		1		34
2400 - 5508 - BROADWAY @ LANGDON ST	0		0		31	0		0		22	0		1		33
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		31	0		0		22	0		0		33
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		0		31	0		3		19	0		0		33
3600 - 5695 - BROADWAY @ EVERETT SQ	2		2		31	2		4		17	1		4		30
4000 - 5510 - BROADWAY @ MANSFIELD ST	7		0		38	0		0		17	0		0		30
4400 - 5511 - BROADWAY @ SUMMER ST	0		1		37	0		3		14	1		4		27
4800 - 5513 - BROADWAY @ HIGH ST	0		0		37	0		0		14	1		4		24
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		1		36	2		2		14	0		3		21
5600 - 5517 - BROADWAY @ REED AVE	0		3		33	1		0		15	0		1		20
6000 - 5518 - BROADWAY @ FERRY ST	1		7		27	2		2		15	4		4		20
6400 - 5519 - BROADWAY @ COBURN TERR	0		4		23	0		0		15	0		0		20
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		3		20	0		1		14	2		1		21
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1		19	0		0		14	0		0		21
7600 - 5521 - BROADWAY @ LYNN ST	0		2		17	0		4		10	0		6		15
8000 - 5522 - BROADWAY @ SHUTE ST	0		2		15	0		0		10	4		1		18
8400 - 5523 - BROADWAY @ ESTES ST	0		0		15	0		0		10	0		0		18
8800 - 5524 - 53 BROADWAY	0		5		10	0		0		10	0		7		11
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		10	0		0		10	0		1		10
9600 - 5526 - 170 BROADWAY	0		0		10	0		0		10	0		0		10
10000 - 5527 - EASTERN AVE @ BROADWAY	0		2		8	0		0		10	0		2		8
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		8	0		0		10	0		0		8
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		8	0		0		10	0		0		8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		8	0		1		9	0		0		8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		8	0		0		9	0		0		8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		8	0		0		9	0		0		8
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		8	0		0		9	0		0		8
12800 - 7417 - WESLEY ST @ LYNN ST	3		4		7	0		3		6	0		5		3
13200 - 7412 - LYNN ST @ BEACH ST	0		0	4	3	0		3	3	0	0		0	3	0
Maximum					38					27					36
Total	40		37			31		31			46		46		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:15 (109.0) [2] !Fall 2012!					18:45 (109.0) [1] !Fall 2012!					19:35 (109.0) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	41.5		0		41.5	27		0		27	38		0		38
800 - 5504 - ALFORD ST @ MAIN ST	1.5		1		42	0		0		27	0		0		38
1200 - 5505 - 173 ALFORD ST	0	4	0		46	0	3	0		30	0	5	0		43
1600 - 5506 - BROADWAY @ DEXTER ST	0		0.5		45.5	0		0		30	0		0		43
2000 - 5507 - BROADWAY @ THORNDIKE ST	0		0.5		45	0		1		29	0		0		43
2400 - 5508 - BROADWAY @ LANGDON ST	0.5		0		45.5	1		0		30	1		3		41
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		45.5	0		0		30	0		0		41
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		2		43.5	0		1		29	1		1		41
3600 - 5695 - BROADWAY @ EVERETT SQ	3.5		4.5		42.5	5		0		34	1		2		40
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0		42.5	0		0		34	0		1		39
4400 - 5511 - BROADWAY @ SUMMER ST	0		6		36.5	0		0		34	0		2		37
4800 - 5513 - BROADWAY @ HIGH ST	0.5		1.5		35.5	0		0		34	0		1		36
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		3		32.5	0		0		34	0		4		32
5600 - 5517 - BROADWAY @ REED AVE	1		0.5		33	0		0		34	0		0		32
6000 - 5518 - BROADWAY @ FERRY ST	0.5		7		26.5	3		3		34	8		2		38
6400 - 5519 - BROADWAY @ COBURN TERR	0		1.5		25	0		0		34	0		0		38
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		1		24	0		0		34	0		0		38
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.5		23.5	0		3		31	0		0		38
7600 - 5521 - BROADWAY @ LYNN ST	0		2		21.5	0		2		29	3		0		41
8000 - 5522 - BROADWAY @ SHUTE ST	1		2.5		20	0		2		27	0		0		41
8400 - 5523 - BROADWAY @ ESTES ST	0		3		17	0		2		25	0		2		39
8800 - 5524 - 53 BROADWAY	1		4.5		13.5	4		5		24	0		6		33
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		13.5	0		0		24	0		0		33
9600 - 5526 - 170 BROADWAY	0		1		12.5	0		3		21	0		0		33
10000 - 5527 - EASTERN AVE @ BROADWAY	0		1		11.5	0		0		21	0		2		31
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		11.5	0		0		21	0		0		31
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		11.5	0		0		21	0		0		31
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		11.5	0		0		21	0		0		31
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		1.5		10	0		3		18	0		1		30
12000 - 5532 - EASTERN AVE @ LYNN ST	0		1		9	0		0		18	0		0		30
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		9	0		2		16	0		0		30
12800 - 7417 - WESLEY ST @ LYNN ST	0		5		4	0		13		3	1		23		8
13200 - 7412 - LYNN ST @ BEACH ST	0		0	4	0	0		0	3	0	0		2	5	1
Maximum					46					34					43
Total	51		51			40		40			53		52		

Massachusetts Bay Transportation Authority
Route 109
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	20:25 (109.0) [1] !Fall 2012!					21:15 (109.0) [2] !Winter 2013!					22:05 (109.0) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	53		0		53	38		0		38	34.8		0		34.8
800 - 5504 - ALFORD ST @ MAIN ST	0		0		53	0		0		38	0		0		34.8
1200 - 5505 - 173 ALFORD ST	0	4	0		57	0	5	0		43	0	2	0		36.8
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		57	0		0		43	0		0.2		36.6
2000 - 5507 - BROADWAY @ THORNDIKE ST	1		0		58	1		0.5		43.5	0		0.2		36.4
2400 - 5508 - BROADWAY @ LANGDON ST	0		2		56	0.5		0.5		43.5	0.4		1.4		35.4
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0		0		56	0		0		43.5	0.2		1		34.6
3200 - 5565 - BROADWAY @ GLADSTONE ST	0		4		52	0		3.5		40	0		5.2		29.4
3600 - 5695 - BROADWAY @ EVERETT SQ	0		1		51	1.5		8		33.5	0.4		2.2		27.6
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		0		51	1.5		2.5		32.5	0.2		1.2		26.6
4400 - 5511 - BROADWAY @ SUMMER ST	0		7		44	0		2.5		30	0.2		1		25.8
4800 - 5513 - BROADWAY @ HIGH ST	0		3		41	0		4		26	0.4		4.4		21.8
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		3		38	0		2.5		23.5	0.2		1.6		20.4
5600 - 5517 - BROADWAY @ REED AVE	0		1		37	0		2		21.5	0		1.6		18.8
6000 - 5518 - BROADWAY @ FERRY ST	0		16		21	0		6		15.5	0.4		5.2		14
6400 - 5519 - BROADWAY @ COBURN TERR	0		0		21	0		0.5		15	0		0.4		13.6
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		2		19	0		0.5		14.5	0		0.6		13
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		1		18	0.5		1		14	0.2		1.6		11.6
7600 - 5521 - BROADWAY @ LYNN ST	0		4		14	0		1		13	0.2		1		10.8
8000 - 5522 - BROADWAY @ SHUTE ST	0		0		14	0		0		13	0		1		9.8
8400 - 5523 - BROADWAY @ ESTES ST	0		3		11	0		0		13	0.2		2		8
8800 - 5524 - 53 BROADWAY	1		3		9	1		1.5		12.5	0		0.2		7.8
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		3		6	0		0		12.5	0		0.2		7.6
9600 - 5526 - 170 BROADWAY	0		0		6	0		0		12.5	0		0		7.6
10000 - 5527 - EASTERN AVE @ BROADWAY	0		0		6	0		1		11.5	0		0.2		7.4
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		6	0		0		11.5	0		0		7.4
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0		6	0		0		11.5	0		0.6		6.8
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0		6	0		0		11.5	0		0		6.8
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0		6	0		1		10.5	0		0		6.8
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		6	0		1		9.5	0		0.6		6.2
12400 - 7413 - BEACH ST @ HANCOCK RD	0		0		6	0		1		8.5	0		0		6.2
12800 - 7417 - WESLEY ST @ LYNN ST	0		2		4	0		2.5		6	0.4		3		3.6
13200 - 7412 - LYNN ST @ BEACH ST	0		0	4	0	0		1	5	0	0		1.2	2	0.4
Maximum					58					43.5					36.8
Total	55		55			44		44			38.2		37.8		

Massachusetts Bay Transportation Authority

Route 109

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

	22:55 (109.0) [5] !Fall 2012!					23:45 (109.0) [5] !Fall 2012!					24:55 (109.0) [1] !Manual wi02 interpolated!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	41		0		41	43.8		0		43.8	26.28		0		26.28
800 - 5504 - ALFORD ST @ MAIN ST	0		0		41	0		0		43.8	0		0		26.28
1200 - 5505 - 173 ALFORD ST	0	3	0		44	0.2	5	0		49	0.12	4	0		30.4
1600 - 5506 - BROADWAY @ DEXTER ST	0		0		44	0		0		49	0		0		30.4
2000 - 5507 - BROADWAY @ THORNDIKE ST	0.8		1.4		43.4	0.6		2.4		47.2	0.36		1.44		29.32
2400 - 5508 - BROADWAY @ LANGDON ST	0.2		0		43.6	0		0.2		47	0		0.12		29.2
2800 - 5509 - BROADWAY ST @ BARTLETT ST	0.4		0.8		43.2	0		0.4		46.6	0		0.24		28.96
3200 - 5565 - BROADWAY @ GLADSTONE ST	0.4		1.4		42.2	0		1.6		45	0		0.96		28
3600 - 5695 - BROADWAY @ EVERETT SQ	0.6		2.4		40.4	0		4.4		40.6	0		2.64		25.36
4000 - 5510 - BROADWAY @ MANSFIELD ST	0		1.6		38.8	0		1.4		39.2	0		0.84		24.52
4400 - 5511 - BROADWAY @ SUMMER ST	0.2		3.4		35.6	0.6		1.4		38.4	0.36		0.84		24.04
4800 - 5513 - BROADWAY @ HIGH ST	0.2		6.4		29.4	0.6		4.6		34.4	0.36		2.76		21.64
5200 - 5514 - BROADWAY @ LEXINGTON ST	0		3.6		25.8	0		2		32.4	0		1.2		20.44
5600 - 5517 - BROADWAY @ REED AVE	0.2		3.4		22.6	0		1.6		30.8	0		0.96		19.48
6000 - 5518 - BROADWAY @ FERRY ST	0.2		8.4		14.4	0.8		9.8		21.8	0.48		5.88		14.08
6400 - 5519 - BROADWAY @ COBURN TERR	0		1.4		13	0		0.4		21.4	0		0.24		13.84
6800 - 5515 - BROADWAY @ GLEDHILL ST	0		0.2		12.8	0		1		20.4	0		0.6		13.24
7200 - 5520 - BROADWAY @ SUMMIT AVE	0		0.8		12	0		1.6		18.8	0		0.96		12.28
7600 - 5521 - BROADWAY @ LYNN ST	0		0.6		11.4	0		0.8		18	0		0.48		11.8
8000 - 5522 - BROADWAY @ SHUTE ST	0		0.4		11	0		1.4		16.6	0		0.84		10.96
8400 - 5523 - BROADWAY @ ESTES ST	0		0.8		10.2	0.2		0		16.8	0.12		0		11.08
8800 - 5524 - 53 BROADWAY	0.2		0		10.4	0.4		1.6		15.6	0.24		0.96		10.36
9200 - 5525 - BROADWAY OPP SHEAFE ST	0		0		10.4	0		2		13.6	0		1.2		9.16
9600 - 5526 - 170 BROADWAY	0		0		10.4	0		0.2		13.4	0		0.12		9.04
10000 - 5527 - EASTERN AVE @ BROADWAY	0.2		3.6		7	0.2		1.2		12.4	0.12		0.72		8.44
10400 - 5528 - OPP 1236 EASTERN AVE	0		0		7	0		0		12.4	0		0		8.44
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0		0.4		6.6	0		0		12.4	0		0		8.44
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0		0.4		6.2	0		0.4		12	0		0.24		8.2
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0		0.8		5.4	0		2		10	0		1.2		7
12000 - 5532 - EASTERN AVE @ LYNN ST	0		0		5.4	0		2.2		7.8	0		1.32		5.68
12400 - 7413 - BEACH ST @ HANCOCK RD	0.6		0		6	0.4		0.4		7.8	0.24		0.24		5.68
12800 - 7417 - WESLEY ST @ LYNN ST	0		3		3	0		1.5		6.3	0		0.9		4.78
13200 - 7412 - LYNN ST @ BEACH ST	0		0	3	8E-15	0		1.2	5	0.1	0		0.72	4	0.06
Maximum					44					49					30.4
Total	45.2		45.2			47.8		47.7			28.68		28.62		

Massachusetts Bay Transportation Authority

Route 109

Saturday - Outbound

Fall 2012

(Urban Transportation Associates)

	Total		
Seq - StopID - Stop Name	On	Off	Load
400 - 2874 - SULLIVAN STATION - UPPER BUSW	745.38	0	745.38
800 - 5504 - ALFORD ST @ MAIN ST	6	2	749.38
1200 - 5505 - 173 ALFORD ST	0.32	0.5	871.2
1600 - 5506 - BROADWAY @ DEXTER ST	0	1.7	869.5
2000 - 5507 - BROADWAY @ THORNDIKE ST	6.26	17.44	858.32
2400 - 5508 - BROADWAY @ LANGDON ST	7.6	19.72	846.2
2800 - 5509 - BROADWAY ST @ BARTLETT ST	3.1	7.44	841.86
3200 - 5565 - BROADWAY @ GLADSTONE ST	10.4	38.16	814.1
3600 - 5695 - BROADWAY @ EVERETT SQ	54	67.64	800.46
4000 - 5510 - BROADWAY @ MANSFIELD ST	38.2	25.54	813.12
4400 - 5511 - BROADWAY @ SUMMER ST	19.86	50.64	782.34
4800 - 5513 - BROADWAY @ HIGH ST	12.56	55.66	739.24
5200 - 5514 - BROADWAY @ LEXINGTON ST	7.2	47.4	699.04
5600 - 5517 - BROADWAY @ REED AVE	5.7	31.06	673.68
6000 - 5518 - BROADWAY @ FERRY ST	53.38	150.28	576.78
6400 - 5519 - BROADWAY @ COBURN TERR	8.5	17.94	567.34
6800 - 5515 - BROADWAY @ GLEDHILL ST	5.5	20.4	552.44
7200 - 5520 - BROADWAY @ SUMMIT AVE	2.7	18.46	536.68
7600 - 5521 - BROADWAY @ LYNN ST	7.2	39.88	504
8000 - 5522 - BROADWAY @ SHUTE ST	5.5	24.14	485.36
8400 - 5523 - BROADWAY @ ESTES ST	1.02	22.8	463.58
8800 - 5524 - 53 BROADWAY	12.34	71.26	404.66
9200 - 5525 - BROADWAY OPP SHEAFE ST	0	11.9	392.76
9600 - 5526 - 170 BROADWAY	0	11.32	381.44
10000 - 5527 - EASTERN AVE @ BROADWAY	1.52	30.72	352.24
10400 - 5528 - OPP 1236 EASTERN AVE	0	0	352.24
10800 - 5529 - EASTERN AVE @ PRENTISS ST	0	3.5	348.74
11200 - 5530 - EASTERN AVE @ BELLVALE ST	0	5.54	343.2
11600 - 5531 - EASTERN AVE @ CLEVELAND ST	0	19.5	323.7
12000 - 5532 - EASTERN AVE @ LYNN ST	0	15.12	308.58
12400 - 7413 - BEACH ST @ HANCOCK RD	3.24	10.64	301.18
12800 - 7417 - WESLEY ST @ LYNN ST	6.9	153.9	154.18
13200 - 7412 - LYNN ST @ BEACH ST	0	25.62	6.56
Maximum	0	0	915.7
Total	1024.38	1017.82	0

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	05:50 (134.7) [9] !Fall 2012!					06:10 (134.5) [11] !Fall 2012!					06:15 (134.6) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1	1.9	1	0		2.9		0			0
800 - 8853 - 1076 MAIN ST					1	0		0		2.9					0
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1	0.2		0		3.1					0
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1	0.5		0		3.6					0
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1	0.1		0		3.7					0
2400 - 8857 - 940 MAIN ST					1	0		0		3.7					0
2800 - 8858 - MAIN ST @ NICHOLS ST					1	4.1		0		7.8					0
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1					7.8					0
3600 - 8860 - ELM ST @ TRAVERSE ST					1	0.9		0		8.7					0
4000 - 8861 - ELM ST @ WARD ST					1	1.6		0		10.3					0
4400 - 8862 - ELM ST @ WEST ST					1	1.2		0		11.5					0
4800 - 8863 - ELM ST @ MONUMENT					1	5.1		0		16.6					0
5200 - 10016 - TRADECENTER 128					1					16.6					0
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1	0		0		16.6					0
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1	0.2		0		16.8					0
6400 - 8866 - MAIN ST @ EATON AVE					1	1		0		17.8					0
6800 - 8867 - 646 MAIN ST					1	0.5		0.1		18.2					0
7200 - 8868 - MAIN ST @ CHARLES ST					1	0.1		0		18.3					0
7600 - 8869 - MAIN ST @ KILBY ST					1	1.3		0		19.6					0
8000 - 8870 - 466 MAIN ST OPP UNION ST					1	3.1		0.2		22.5					0
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1	3.1		0		25.6					0
8800 - 6941 - MAIN ST @ MYRTLE ST					1	1.8		0		27.4					0
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1	0.5		0		27.9					0
9600 - 6943 - MAIN ST @ WARREN AVE					1	0.7		0		28.6					0
10000 - 6944 - MAIN ST @ RICHARDSON ST					1	2.6		0		31.2					0
10400 - 6945 - 96 MAIN ST					1	1.8		0.1		32.9					0
10800 - 6946 - MAIN ST @ LYDON CT					1	0.9		0		33.8					0
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1	0		0.1		33.7					0
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1	0.5		0.1		34.1					0
12000 - 6949 - MAIN ST @ CANAL ST					1	0.7		0.3		34.5					0
12400 - 6950 - MAIN ST @ CLARK ST					1	0.7		0		35.2					0
12800 - 6951 - MAIN ST @ LAKE ST					1	0.6		0.6		35.2					0
13200 - 6952 - MAIN ST @ VINE ST					1	0		0		35.2					0
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1	0.5		1		34.7					0
14000 - 6953 - MAIN ST @ WASHINGTON ST					1	0		0		34.7					0
14400 - 6954 - MAIN ST @ MYSTIC AVE					1	0		0		34.7					0
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1	0.6		0		35.3					0
15200 - 6956 - MAIN ST @ W MADISON AVE					1	0		0		35.3					0
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1	0		0		35.3					0
16000 - 6958 - 104 MAIN ST					1	0		0		35.3					0
16400 - 6959 - MAIN ST @ GATEWAY S					1	0		0		35.3					0
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1	0		0		35.3					0
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1	0		0		35.3					0

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	05:50 (134.7) [9] !Fall 2012!					06:10 (134.5) [11] !Fall 2012!					06:15 (134.6) [5] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD					1	0.3		0		35.6	0.4		0		0.4
18000 - 9146 - 578 WINTHROP ST.					1	0		0		35.6	0		0		0.4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED					1	0.2		0		35.8	0		0		0.4
18800 - 9149 - WINTHROP ST @ EXETER ST					1	0.1		0		35.9	0		0		0.4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST					1	0		0		35.9	0		0		0.4
19600 - 5008 - 300 WINTHROP ST					1	0		0		35.9	0		0		0.4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH					1	0.1		0		36	0		0		0.4
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD					1	0.5		0		36.5	0		0		0.4
20800 - 6324 - HIGH ST OPP GOVERNORS AVE					1	0.1		0.9		35.7	0		0		0.4
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0.9		0		1.9					35.7					0.4
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	2		0		3.9	0.8		0.5		36	1.4		0		1.8
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO					3.9	0.3		0		36.3	0		0		1.8
22400 - 9152 - 163 RIVERSIDE AVE	0		0		3.9	0		0		36.3	0		0		1.8
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	1		0		4.9	0.3		0.1		36.5	1.6		0		3.4
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.2		0		5.1	0.5		0.1		36.9	0.6		0		4
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	1.4		0		6.5	0.4		0.2		37.1	0.6		0		4.6
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	1		0		7.5	1.2		0.1		38.2	0		0		4.6
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.2		0		7.7	0		0		38.2	0.6		0		5.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					7.7					38.2					5.2
26000 - 49157 - 61 LOCUST ST	4		0		11.7	3.2		0		41.4	4.4		0		9.6
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.4		0		12.1	0.1		0.6		40.9	1.4		0		11
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.8		0		12.9	2.1		0.1		42.9	1		0		12
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		12.9	0		0		42.9	0		0		12
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0.1		0		13	0.1		0.1		42.9	0.2		0		12.2
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.1		12.9	0.1		0.4		42.6	0		0		12.2
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.6		0		13.5	0.5		0.1		43	0.2		0		12.4
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.1		13.4	0.3		0.5		42.8	0		0.4		12
29200 - 5271 - WELLINGTON STATION BUSWAY	0		10.8		2.6	0		41.7		1.1	0		12		-1.8E-15
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					2.6					1.1					-1.8E-15
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					2.6					1.1					-1.8E-15
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					2.6					1.1					-1.8E-15
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					2.6					1.1					-1.8E-15
Maximum				1	13.5				1	43				0	12.4
Total	12.7		11		15.2	47.8		47.8		43	12.4		12.4		12.4

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	07:00 (134.6) [5] !Fall 2012!					07:10 (134.5) [7] !Fall 2012!					07:15 (134.6) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		0			0	1.9	1	0		2.9		0			0
800 - 8853 - 1076 MAIN ST					0	0		0		2.9					0
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					0	0.3		0		3.2					0
1600 - 8855 - MAIN ST @ MOUNTAIN ST					0	0.4		0		3.6					0
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					0	0.3		0		3.9					0
2400 - 8857 - 940 MAIN ST					0	0		0		3.9					0
2800 - 8858 - MAIN ST @ NICHOLS ST					0	3.6		0		7.5					0
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					0					7.5					0
3600 - 8860 - ELM ST @ TRAVERSE ST					0	0.1		0		7.6					0
4000 - 8861 - ELM ST @ WARD ST					0	1		0		8.6					0
4400 - 8862 - ELM ST @ WEST ST					0	0.1		0		8.7					0
4800 - 8863 - ELM ST @ MONUMENT					0	4.4		0.1		13					0
5200 - 10016 - TRADECENTER 128					0					13					0
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					0	0		0.1		12.9					0
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					0	0		0		12.9					0
6400 - 8866 - MAIN ST @ EATON AVE					0	0		0		12.9					0
6800 - 8867 - 646 MAIN ST					0	0.1		0		13					0
7200 - 8868 - MAIN ST @ CHARLES ST					0	0.1		0		13.1					0
7600 - 8869 - MAIN ST @ KILBY ST					0	1.4		0		14.5					0
8000 - 8870 - 466 MAIN ST OPP UNION ST					0	1.9		0.4		16					0
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					0	6.7		1.3		21.4					0
8800 - 6941 - MAIN ST @ MYRTLE ST					0	0		0.3		21.1					0
9200 - 6942 - 226 MAIN ST OPP GREEN ST					0	0.4		0.3		21.2					0
9600 - 6943 - MAIN ST @ WARREN AVE					0	0.6		0.1		21.7					0
10000 - 6944 - MAIN ST @ RICHARDSON ST					0	1		0.4		22.3					0
10400 - 6945 - 96 MAIN ST					0	3		0.6		24.7					0
10800 - 6946 - MAIN ST @ LYDON CT					0	4.4		0.3		28.8					0
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					0	0		0		28.8					0
11600 - 6948 - MAIN ST @ HEMINGWAY ST					0	0.1		0		28.9					0
12000 - 6949 - MAIN ST @ CANAL ST					0	2.3		0		31.2					0
12400 - 6950 - MAIN ST @ CLARK ST					0	0.3		0		31.5					0
12800 - 6951 - MAIN ST @ LAKE ST					0	0.9		0.1		32.3					0
13200 - 6952 - MAIN ST @ VINE ST					0	0		0.1		32.2					0
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					0	1.9		4.9		29.2					0
14000 - 6953 - MAIN ST @ WASHINGTON ST					0	0		0		29.2					0
14400 - 6954 - MAIN ST @ MYSTIC AVE					0	0		0		29.2					0
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					0	0		0		29.2					0
15200 - 6956 - MAIN ST @ W MADISON AVE					0	0		0		29.2					0
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					0	0		0		29.2					0
16000 - 6958 - 104 MAIN ST					0	0		0		29.2					0
16400 - 6959 - MAIN ST @ GATEWAY S					0	0		0		29.2					0
16800 - 6960 - WINTHROP ST @ ROBINSON RD					0	0		0		29.2					0
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					0	0		0		29.2					0

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	07:00 (134.6) [5] !Fall 2012!					07:10 (134.5) [7] !Fall 2012!					07:15 (134.6) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0.2		0		0.2	0.4		0.9		28.7	0		0		0
18000 - 9146 - 578 WINTHROP ST.	0		0		0.2	0		0		28.7	0		0		0
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		0.2	0.1		0		28.8	0		0		0
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		0.2	0.3		0		29.1	0.1		0		0.1
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.2		0		0.4	0		0		29.1	0.9		0		1
19600 - 5008 - 300 WINTHROP ST	0.2		0		0.6	0		0		29.1	0		0		1
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.6		0		1.2	0.1		0.1		29.1	1		0		2
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.2		0		1.4	0.1		0		29.2	0.3		0		2.3
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.2		0		1.6	0.6		1.6		28.2	1.5		0		3.8
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					1.6					28.2					3.8
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	0.4		0		2	1.7		0.1		29.8	1.8		0.1		5.5
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	1.8		0		3.8	0.7		0		30.5	0.5		0		6
22400 - 9152 - 163 RIVERSIDE AVE	0		0		3.8	0		0		30.5	0		0		6
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	2		0		5.8	1.3		0		31.8	0.9		0		6.9
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	1.4		0		7.2	2.1		0.1		33.8	1.1		1		7
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		7.2	0.3		0		34.1	0.9		0		7.9
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	2.2		0		9.4	3		0.3		36.8	2.1		0		10
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	1		0		10.4	0.1		0		36.9	1.4		0.3		11.1
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					10.4					36.9					11.1
26000 - 49157 - 61 LOCUST ST	6.8		0		17.2	5.9		0.1		42.7	6		0.4		16.7
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.6		0		18.8	2.7		0.1		45.3	1		0.1		17.6
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	2.6		0		21.4	2.1		0.1		47.3	1.5		0		19.1
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		21.4	0		0		47.3	1		0.3		19.8
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0.2		0		21.6	0		0		47.3	0.1		0		19.9
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0.4		0.8		21.2	0		0.1		47.2	0.4		0.3		20
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.4		0		22.6	1		0		48.2	2.4		0		22.4
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.4		0.4		23.6	0.9		0.1		49	2		0.1		24.3
29200 - 5271 - WELLINGTON STATION BUSWAY	0		21.8		1.8	0		47.7		1.3	0		24.3		-3.6E-15
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					1.8					1.3					-3.6E-15
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					1.8					1.3					-3.6E-15
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					1.8					1.3					-3.6E-15
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					1.8					1.3					-3.6E-15
Maximum				0	23.6				1	49				0	24.3
Total	24.8		23		25.4	60.9		60.7		49.2	26.8		26.8		24.3

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
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	07:25 (134.6) [10] !Spring 2013!					07:57 (134.6) [7] !Fall 2012!					08:10 (134.5) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		0			0		0			0	0.3	1	0		1.3
800 - 8853 - 1076 MAIN ST					0					0	0		0		1.3
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					0					0	0.5		0		1.8
1600 - 8855 - MAIN ST @ MOUNTAIN ST					0					0	0.8		0		2.6
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					0					0	0.3		0		2.9
2400 - 8857 - 940 MAIN ST					0					0	0		0		2.9
2800 - 8858 - MAIN ST @ NICHOLS ST					0					0	2.8		0		5.7
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					0					0					5.7
3600 - 8860 - ELM ST @ TRAVERSE ST					0					0	0.5		0		6.2
4000 - 8861 - ELM ST @ WARD ST					0					0	0		0		6.2
4400 - 8862 - ELM ST @ WEST ST					0					0	0.3		0		6.5
4800 - 8863 - ELM ST @ MONUMENT					0					0	5		0.5		11
5200 - 10016 - TRADECENTER 128					0					0					11
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					0					0	0		0		11
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					0					0	0		0		11
6400 - 8866 - MAIN ST @ EATON AVE					0					0	0		0		11
6800 - 8867 - 646 MAIN ST					0					0	0		0		11
7200 - 8868 - MAIN ST @ CHARLES ST					0					0	0		0		11
7600 - 8869 - MAIN ST @ KILBY ST					0					0	1.5		0		12.5
8000 - 8870 - 466 MAIN ST OPP UNION ST					0					0	0.5		1		12
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					0					0	3		1		14
8800 - 6941 - MAIN ST @ MYRTLE ST					0					0	0.3		0		14.3
9200 - 6942 - 226 MAIN ST OPP GREEN ST					0					0	1.8		0.3		15.8
9600 - 6943 - MAIN ST @ WARREN AVE					0					0	1.3		0		17.1
10000 - 6944 - MAIN ST @ RICHARDSON ST					0					0	0		0		17.1
10400 - 6945 - 96 MAIN ST					0					0	1.3		0		18.4
10800 - 6946 - MAIN ST @ LYDON CT					0					0	0.5		0		18.9
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					0					0	0		0		18.9
11600 - 6948 - MAIN ST @ HEMINGWAY ST					0					0	0		0.3		18.6
12000 - 6949 - MAIN ST @ CANAL ST					0					0	0		0		18.6
12400 - 6950 - MAIN ST @ CLARK ST					0					0	1.3		0		19.9
12800 - 6951 - MAIN ST @ LAKE ST					0					0	0.5		0		20.4
13200 - 6952 - MAIN ST @ VINE ST					0					0	0		0		20.4
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					0					0	2		2.3		20.1
14000 - 6953 - MAIN ST @ WASHINGTON ST					0					0	0		0		20.1
14400 - 6954 - MAIN ST @ MYSTIC AVE					0					0	0		0		20.1
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					0					0	0.3		0		20.4
15200 - 6956 - MAIN ST @ W MADISON AVE					0					0	0		0		20.4
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					0					0	0		0		20.4
16000 - 6958 - 104 MAIN ST					0					0	0		0		20.4
16400 - 6959 - MAIN ST @ GATEWAY S					0					0	0		0		20.4
16800 - 6960 - WINTHROP ST @ ROBINSON RD					0					0	0		0		20.4
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					0					0	0		0		20.4

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	07:25 (134.6) [10] !Spring 2013!					07:57 (134.6) [7] !Fall 2012!					08:10 (134.5) [4] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0.3		0		0.3	0.4		0		0.4	0		0		20.4
18000 - 9146 - 578 WINTHROP ST.	0		0		0.3	0		0		0.4	0		0		20.4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		0.3	0.3		0		0.7	0.3		0		20.7
18800 - 9149 - WINTHROP ST @ EXETER ST	0.1		0		0.4	0		0		0.7	0		0		20.7
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.2		0		0.6	0.3		0		1	0		0		20.7
19600 - 5008 - 300 WINTHROP ST	0.1		0		0.7	0		0		1	0		0		20.7
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.3		0		1	0		0.1		0.9	1		0		21.7
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		1	0		0		0.9	1.8		0		23.5
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	1.4		0.1		2.3	0.4		0		1.3	0.5		0.8		23.2
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					2.3					1.3					23.2
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	1.4		0.3		3.4	0.9		0		2.2	1		1.8		22.4
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.1		0		3.5	0		0		2.2	0.8		0		23.2
22400 - 9152 - 163 RIVERSIDE AVE	0		0		3.5	0.1		0		2.3	0.5		0		23.7
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.5		0		4	0.4		0		2.7	0.5		0		24.2
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	1.4		1.3		4.1	1.3		0		4	1.3		0.3		25.2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.6		0		4.7	0.1		0.1		4	1.5		0		26.7
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	1.1		0		5.8	1.4		0		5.4	2		0.3		28.4
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.2		0		6	0.1		0.1		5.4	0.5		0		28.9
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					6					5.4					28.9
26000 - 49157 - 61 LOCUST ST	4.3		0.1		10.2	3.9		0.1		9.2	2		0.8		30.1
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.5		0.1		10.6	0.7		0.1		9.8	1.3		0.8		30.6
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	2.1		0		12.7	1.4		0		11.2	1.3		0		31.9
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.1		0		12.8	0.1		0		11.3	0		0		31.9
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0.2		0		13	0		0		11.3	0		0		31.9
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.2		12.8	0		0		11.3	0		0		31.9
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.8		0		13.6	1.3		0		12.6	1.8		0		33.7
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.2		0.1		13.7	1.4		0		14	2.5		0.3		35.9
29200 - 5271 - WELLINGTON STATION BUSWAY	0		13.8		-0.1	0		13.7		0.3	0		33.3		2.6
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					-0.1					0.3					2.6
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					-0.1					0.3					2.6
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					-0.1					0.3					2.6
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					-0.1					0.3					2.6
Maximum				0	13.7				0	14				1	35.9
Total	15.9		16		13.6	14.7		14.4		14.3	44.5		43.3		37.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	08:15 (134.6) [7] !Fall 2012!					09:10 (134.3) [12] !Fall 2012!					09:10 (134.6) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		0			0	1	1	0		2		1			1
800 - 8853 - 1076 MAIN ST					0	0		0		2					1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					0	0.6		0		2.6					1
1600 - 8855 - MAIN ST @ MOUNTAIN ST					0	0.3		0		2.9					1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					0	0		0		2.9					1
2400 - 8857 - 940 MAIN ST					0	0		0		2.9					1
2800 - 8858 - MAIN ST @ NICHOLS ST					0	1.5		0		4.4					1
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					0					4.4					1
3600 - 8860 - ELM ST @ TRAVERSE ST					0	0.3		0		4.7					1
4000 - 8861 - ELM ST @ WARD ST					0	0.2		0		4.9					1
4400 - 8862 - ELM ST @ WEST ST					0	0.3		0		5.2					1
4800 - 8863 - ELM ST @ MONUMENT					0	3.3		0.4		8.1					1
5200 - 10016 - TRADECENTER 128					0	0.3		0.1		8.3					1
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					0	0		0		8.3					1
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					0	0		0		8.3					1
6400 - 8866 - MAIN ST @ EATON AVE					0	0		0		8.3					1
6800 - 8867 - 646 MAIN ST					0	0.3		0		8.6					1
7200 - 8868 - MAIN ST @ CHARLES ST					0	0.3		0		8.9					1
7600 - 8869 - MAIN ST @ KILBY ST					0	0.3		0		9.2					1
8000 - 8870 - 466 MAIN ST OPP UNION ST					0	2.8		0.2		11.8					1
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					0	3.8		0.4		15.2					1
8800 - 6941 - MAIN ST @ MYRTLE ST					0	0.6		0.1		15.7					1
9200 - 6942 - 226 MAIN ST OPP GREEN ST					0	0.8		0.2		16.3					1
9600 - 6943 - MAIN ST @ WARREN AVE					0	1		0		17.3					1
10000 - 6944 - MAIN ST @ RICHARDSON ST					0	0.1		0		17.4					1
10400 - 6945 - 96 MAIN ST					0	0.1		0		17.5					1
10800 - 6946 - MAIN ST @ LYDON CT					0	1.2		0.2		18.5					1
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					0	0		0.1		18.4					1
11600 - 6948 - MAIN ST @ HEMINGWAY ST					0	0.4		0		18.8					1
12000 - 6949 - MAIN ST @ CANAL ST					0	1.4		0.2		20					1
12400 - 6950 - MAIN ST @ CLARK ST					0	0.3		0.1		20.2					1
12800 - 6951 - MAIN ST @ LAKE ST					0	0.8		0		21					1
13200 - 6952 - MAIN ST @ VINE ST					0	0		0.1		20.9					1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					0	0.8		0.5		21.2					1
14000 - 6953 - MAIN ST @ WASHINGTON ST					0	0		0		21.2					1
14400 - 6954 - MAIN ST @ MYSTIC AVE					0	0.1		0		21.3					1
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					0	0		0.2		21.1					1
15200 - 6956 - MAIN ST @ W MADISON AVE					0	0		0.3		20.8					1
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					0	0		0		20.8					1
16000 - 6958 - 104 MAIN ST					0	0		0		20.8					1
16400 - 6959 - MAIN ST @ GATEWAY S					0	0		0		20.8					1
16800 - 6960 - WINTHROP ST @ ROBINSON RD					0	0		0		20.8					1
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					0	0		0		20.8					1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	08:15 (134.6) [7] !Fall 2012!					09:10 (134.3) [12] !Fall 2012!					09:10 (134.6) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	1.6		0		1.6	0.2		0.1		20.9	0		0		1
18000 - 9146 - 578 WINTHROP ST.	0		0		1.6	0		0		20.9	0		0		1
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0.6		0		2.2	0.5		0		21.4	2.6		0		3.6
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		2.2	0		0		21.4	0		0		3.6
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.3		0		2.5	0.1		0		21.5	0.4		0		4
19600 - 5008 - 300 WINTHROP ST	0		0		2.5	0		0.2		21.3	0.4		0.4		4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.1		0		2.6	0.2		0.3		21.2	0		0		4
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		2.6	0.3		0		21.5	0.2		0		4.2
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.1		0.3		2.4	0.3		0.8		21	0.2		0		4.4
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					2.4					21					4.4
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	0.6		0.3		2.7	4		1.2		23.8	4.2		0.6		8
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.4		0		3.1	0.5		0		24.3	0.6		0.2		8.4
22400 - 9152 - 163 RIVERSIDE AVE	0.1		0		3.2	0.1		0		24.4	0.8		0		9.2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.3		0		3.5	0.5		0		24.9	0.8		0		10
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	1.7		0		5.2	1.2		0		26.1	1.2		0.6		10.6
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.3		0		5.5	0.5		0.4		26.2	0.6		0		11.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.1		0		5.6	0.8		0.5		26.5	1.2		0.2		12.2
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.1		0.1		5.6	0.1		0		26.6	1		0.2		13
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					5.6					26.6					13
26000 - 49157 - 61 LOCUST ST	5.4		0.1		10.9	1.1		2.3		25.4	3.4		0.6		15.8
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	3		0.1		13.8	3.2		2.7		25.9	2.2		1		17
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	1.6		0		15.4	1.3		0		27.2	0.6		0		17.6
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.1		0		15.5	0		0		27.2	0		0		17.6
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0.4		0.1		15.8	0.1		0		27.3	0		0		17.6
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0.1		0.1		15.8	0		0.4		26.9	0		0.8		16.8
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	3		0		18.8	1.8		0.3		28.4	0.2		0		17
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.9		0.1		19.6	0.8		0.6		28.6	1.8		0.4		18.4
29200 - 5271 - WELLINGTON STATION BUSWAY	0		19.6		-3.6E-15	0		27.3		1.3	0		17.4		1
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					-3.6E-15					1.3					1
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					-3.6E-15					1.3					1
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					-3.6E-15					1.3					1
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					-3.6E-15					1.3					1
Maximum				0	19.6				1	28.6				1	18.4
Total	21		21		19.6	39.9		39.8		28.7	22.4		22.4		18.4

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	10:05 (134.12) [6] !Fall 2012!					10:10 (134.3) [3] !Fall 2012!					11:10 (134.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1	0	3	0		3	0.6	2	0		2.6
800 - 8853 - 1076 MAIN ST					1	0		0		3	0.2		0		2.8
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1	0		0		3	1		0		3.8
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1	0.7		0		3.7	0.6		0		4.4
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1	0		0		3.7	0.8		0.1		5.1
2400 - 8857 - 940 MAIN ST					1	0		0		3.7	0		0		5.1
2800 - 8858 - MAIN ST @ NICHOLS ST					1	1		0		4.7	0.7		0		5.8
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1					4.7					5.8
3600 - 8860 - ELM ST @ TRAVERSE ST					1	0.3		0		5	0.9		0		6.7
4000 - 8861 - ELM ST @ WARD ST					1	0		0		5	0		0		6.7
4400 - 8862 - ELM ST @ WEST ST					1	2.3		0		7.3	0.2		0		6.9
4800 - 8863 - ELM ST @ MONUMENT					1	1		0		8.3	4.2		0.6		10.5
5200 - 10016 - TRADECENTER 128					1	3.5		0.5		11.3	2.3		0		12.8
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1	0		0		11.3	0		0		12.8
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1	0		0		11.3	0		0		12.8
6400 - 8866 - MAIN ST @ EATON AVE					1	0		0.3		11	0.4		0.1		13.1
6800 - 8867 - 646 MAIN ST					1	0		0.3		10.7	0.1		0		13.2
7200 - 8868 - MAIN ST @ CHARLES ST					1	0.3		0		11	0.5		0		13.7
7600 - 8869 - MAIN ST @ KILBY ST					1	0.3		0		11.3	0.7		0.1		14.3
8000 - 8870 - 466 MAIN ST OPP UNION ST					1	0.3		0		11.6	1.3		1.4		14.2
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1	4.7		0.3		16	5.6		1.4		18.4
8800 - 6941 - MAIN ST @ MYRTLE ST					1	1.3		0		17.3	0.3		0		18.7
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1	0.3		0		17.6	0.8		0		19.5
9600 - 6943 - MAIN ST @ WARREN AVE					1	1		0		18.6	0.8		0.1		20.2
10000 - 6944 - MAIN ST @ RICHARDSON ST					1	0.7		0		19.3	0.3		0		20.5
10400 - 6945 - 96 MAIN ST					1	0		0		19.3	0.3		0.1		20.7
10800 - 6946 - MAIN ST @ LYDON CT					1	2		0		21.3	0.8		0.1		21.4
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1	0		0		21.3	0.2		0		21.6
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1	0		0.3		21	0.2		0.1		21.7
12000 - 6949 - MAIN ST @ CANAL ST					1	1		0.7		21.3	1.3		0		23
12400 - 6950 - MAIN ST @ CLARK ST					1	0		0		21.3	0.5		0.1		23.4
12800 - 6951 - MAIN ST @ LAKE ST					1	0		0.3		21	0.3		0.8		22.9
13200 - 6952 - MAIN ST @ VINE ST					1	0		0		21	0		0		22.9
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1	0.7		1.3		20.4	2.3		1.1		24.1
14000 - 6953 - MAIN ST @ WASHINGTON ST					1	0		0		20.4	0.1		0		24.2
14400 - 6954 - MAIN ST @ MYSTIC AVE					1	0		0		20.4	0		0		24.2
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1	0		0		20.4	0		0		24.2
15200 - 6956 - MAIN ST @ W MADISON AVE					1	0		0		20.4	0.2		0.1		24.3
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1	0		0		20.4	0		0		24.3
16000 - 6958 - 104 MAIN ST					1	0		0		20.4	0		0		24.3
16400 - 6959 - MAIN ST @ GATEWAY S					1	0		0		20.4	0.3		0.1		24.5
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1	0		0		20.4	0		0		24.5
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1	0		0		20.4	0.1		0		24.6

Massachusetts Bay Transportation Authority
Route 134
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	10:05 (134.12) [6] !Fall 2012!					10:10 (134.3) [3] !Fall 2012!					11:10 (134.3) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0.8		0		1.8	0		0		20.4	0.2		0		24.8
18000 - 9146 - 578 WINTHROP ST.	0.2		0		2	0		0		20.4	0		0		24.8
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0.3		0		2.3	0		0		20.4	1.9		0.1		26.6
18800 - 9149 - WINTHROP ST @ EXETER ST	0.3		0		2.6	0		0		20.4	0		0		26.6
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.2		0		2.8	0		0		20.4	0.1		0.2		26.5
19600 - 5008 - 300 WINTHROP ST	0		0		2.8	0		0		20.4	0.1		0.1		26.5
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.2		0		3	0.3		0		20.7	0.4		0.1		26.8
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.3		0		3.3	0.7		0		21.4	0.2		0.2		26.8
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0.2		3.1	0		0.3		21.1	0.2		0.3		26.7
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					3.1					21.1					26.7
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3.5		0.3		6.3	5		1.3		24.8	5.6		2.5		29.8
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	1		0		7.3	1.7		0.3		26.2	0.6		0.2		30.2
22400 - 9152 - 163 RIVERSIDE AVE	0		0		7.3	0.3		0		26.5	0		0		30.2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.7		0		8	0		0		26.5	0.1		0.1		30.2
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.8		0		8.8	1.7		0		28.2	0		0		30.2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.3		0		9.1	0		0		28.2	0.3		0.3		30.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	1		0.2		9.9	2.3		0.3		30.2	0.6		0.3		30.5
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.3		0		10.2	0.7		0.3		30.6	0.2		0.7		30
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE	0		0		10.2					30.6					30
26000 - 49157 - 61 LOCUST ST					10.2	0		1		29.6	1.2		3		28.2
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	4		2.2		12	3		1.7		30.9	4.7		2.1		30.8
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.3		0.2		12.1	0		0		30.9	0.3		0		31.1
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.3		0		12.4	0		0		30.9	0		0		31.1
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0.2		0		12.6	0		0		30.9	0		0		31.1
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.2		12.4	0		0		30.9	0		0.7		30.4
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.8		0.8		12.4	0.3		0.3		30.9	0.9		0.4		30.9
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.3		0.3		12.4	0.7		0		31.6	0.8		0.4		31.3
29200 - 5271 - WELLINGTON STATION BUSWAY	0		12		0.4	0		29		2.6	0		28.6		2.7
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					0.4					2.6					2.7
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					0.4					2.6					2.7
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					0.4					2.6					2.7
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					0.4					2.6					2.7
Maximum				1	12.6				3	31.6				2	31.3
Total	15.9		16.3		12.2	38.2		38.8		31	46.5		46.2		31.6

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
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	11:10 (134.6) [12] !Fall 2012!					12:05 (134.12) [10] !Fall 2012!					12:10 (134.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1		1			1	1.3	2	0		3.3
800 - 8853 - 1076 MAIN ST					1					1	0		0		3.3
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1					1	0.7		0		4
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1					1	0.7		0		4.7
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1					1	0		0		4.7
2400 - 8857 - 940 MAIN ST					1					1	0		0		4.7
2800 - 8858 - MAIN ST @ NICHOLS ST					1					1	1		0		5.7
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1					1					5.7
3600 - 8860 - ELM ST @ TRAVERSE ST					1					1	0.7		0		6.4
4000 - 8861 - ELM ST @ WARD ST					1					1	0.7		0		7.1
4400 - 8862 - ELM ST @ WEST ST					1					1	0		0		7.1
4800 - 8863 - ELM ST @ MONUMENT					1					1	1.3		0.7		7.7
5200 - 10016 - TRADECENTER 128					1					1	2		0.3		9.4
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1					1	0.3		0		9.7
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1					1	0		0		9.7
6400 - 8866 - MAIN ST @ EATON AVE					1					1	0		0		9.7
6800 - 8867 - 646 MAIN ST					1					1	0		1		8.7
7200 - 8868 - MAIN ST @ CHARLES ST					1					1	0.3		0		9
7600 - 8869 - MAIN ST @ KILBY ST					1					1	0.3		0		9.3
8000 - 8870 - 466 MAIN ST OPP UNION ST					1					1	2.3		0.7		10.9
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1					1	4.3		0.7		14.5
8800 - 6941 - MAIN ST @ MYRTLE ST					1					1	0.3		0		14.8
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1					1	1		0		15.8
9600 - 6943 - MAIN ST @ WARREN AVE					1					1	0		0.3		15.5
10000 - 6944 - MAIN ST @ RICHARDSON ST					1					1	0.3		0		15.8
10400 - 6945 - 96 MAIN ST					1					1	0.3		0		16.1
10800 - 6946 - MAIN ST @ LYDON CT					1					1	2		0.3		17.8
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1					1	0		0		17.8
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1					1	0.3		0.7		17.4
12000 - 6949 - MAIN ST @ CANAL ST					1					1	0.3		0		17.7
12400 - 6950 - MAIN ST @ CLARK ST					1					1	0.3		0.3		17.7
12800 - 6951 - MAIN ST @ LAKE ST					1					1	1		0		18.7
13200 - 6952 - MAIN ST @ VINE ST					1					1	0.3		0		19
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1					1	1.7		1		19.7
14000 - 6953 - MAIN ST @ WASHINGTON ST					1					1	0		0		19.7
14400 - 6954 - MAIN ST @ MYSTIC AVE					1					1	0		0		19.7
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1					1	0		0		19.7
15200 - 6956 - MAIN ST @ W MADISON AVE					1					1	0		0		19.7
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1					1	1		0		20.7
16000 - 6958 - 104 MAIN ST					1					1	0		0		20.7
16400 - 6959 - MAIN ST @ GATEWAY S					1					1	0		0		20.7
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1					1	0		0		20.7
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1					1	0		0		20.7

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	11:10 (134.6) [12] !Fall 2012!					12:05 (134.12) [10] !Fall 2012!					12:10 (134.3) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0.6		0		1.6	0.4		0		1.4	0		0		20.7
18000 - 9146 - 578 WINTHROP ST.	0.2		0		1.8	0.3		0		1.7	0		0		20.7
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0.5		0		2.3	1.2		0		2.9	0		0		20.7
18800 - 9149 - WINTHROP ST @ EXETER ST	0.1		0		2.4	0		0		2.9	0		0		20.7
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.2		0		2.6	0		0		2.9	0		0		20.7
19600 - 5008 - 300 WINTHROP ST	0		0		2.6	0		0		2.9	0		0		20.7
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	1.3		0.1		3.8	0.2		0		3.1	1		0		21.7
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		3.8	0		0		3.1	0		0		21.7
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.4		0		4.2	0.3		0.1		3.3	1		1.3		21.4
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					4.2					3.3					21.4
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3.7		0.5		7.4	3.6		0.4		6.5	5.7		3		24.1
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.5		0.1		7.8	0.4		0.1		6.8	0.3		0.3		24.1
22400 - 9152 - 163 RIVERSIDE AVE	0.1		0		7.9	0		0		6.8	0		0		24.1
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.3		0		8.2	0		0		6.8	1.3		0.3		25.1
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.5		0.1		8.6	0.4		0		7.2	0		0.3		24.8
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.3		0		8.9	0		0		7.2	0.3		0.3		24.8
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	2.2		0.2		10.9	0.3		0		7.5	1.7		0.3		26.2
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.6		0.3		11.2	0.7		0		8.2	0.7		0.7		26.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					11.2	0		0.1		8.1					26.2
26000 - 49157 - 61 LOCUST ST	1.6		0.6		12.2					8.1	0.7		1		25.9
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	5.7		1.1		16.8	5.4		1.4		12.1	7		3.3		29.6
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.6		0		17.4	0.5		0.1		12.5	0.7		0		30.3
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		17.4	0		0.1		12.4	0		0		30.3
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		17.4	0		0.3		12.1	0.3		0.3		30.3
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.8		16.6	0		0.2		11.9	0		1.3		29
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.7		1.9		15.4	1		0.2		12.7	0		0		29
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.1		0.4		15.1	0.7		0.2		13.2	0.3		0.7		28.6
29200 - 5271 - WELLINGTON STATION BUSWAY	0		14.1		1	0		12.5		0.7	0		26.3		2.3
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					1					0.7					2.3
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					1					0.7					2.3
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					1					0.7					2.3
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					1					0.7					2.3
Maximum				1	17.4				1	13.2				2	30.3
Total	20.2		20.2		17.4	15.5		15.7		13	46		45.7		30.6

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	13:10 (134.3) [5] !Fall 2012!					13:10 (134.6) [5] !Fall 2012!					14:05 (134.12) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	0.4	2	0		2.4		1			1		1			1
800 - 8853 - 1076 MAIN ST	0		0		2.4					1					1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		2.4					1					1
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0.2		0		2.6					1					1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		2.6					1					1
2400 - 8857 - 940 MAIN ST	0		0		2.6					1					1
2800 - 8858 - MAIN ST @ NICHOLS ST	0.2		0		2.8					1					1
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					2.8					1					1
3600 - 8860 - ELM ST @ TRAVERSE ST	2.2		0		5					1					1
4000 - 8861 - ELM ST @ WARD ST	0		0		5					1					1
4400 - 8862 - ELM ST @ WEST ST	0		0		5					1					1
4800 - 8863 - ELM ST @ MONUMENT	2		0		7					1					1
5200 - 10016 - TRADECENTER 128	1.8		0		8.8					1					1
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		8.8					1					1
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		8.8					1					1
6400 - 8866 - MAIN ST @ EATON AVE	0		0		8.8					1					1
6800 - 8867 - 646 MAIN ST	0		0		8.8					1					1
7200 - 8868 - MAIN ST @ CHARLES ST	0.2		0		9					1					1
7600 - 8869 - MAIN ST @ KILBY ST	0		0		9					1					1
8000 - 8870 - 466 MAIN ST OPP UNION ST	2.6		1.2		10.4					1					1
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	2.8		0.8		12.4					1					1
8800 - 6941 - MAIN ST @ MYRTLE ST	0.4		0		12.8					1					1
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0.8		0.2		13.4					1					1
9600 - 6943 - MAIN ST @ WARREN AVE	1.8		0		15.2					1					1
10000 - 6944 - MAIN ST @ RICHARDSON ST	0.2		0		15.4					1					1
10400 - 6945 - 96 MAIN ST	0.6		0.4		15.6					1					1
10800 - 6946 - MAIN ST @ LYDON CT	0.4		0		16					1					1
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0.2		0		16.2					1					1
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0		0.2		16					1					1
12000 - 6949 - MAIN ST @ CANAL ST	0.6		0		16.6					1					1
12400 - 6950 - MAIN ST @ CLARK ST	0		0.2		16.4					1					1
12800 - 6951 - MAIN ST @ LAKE ST	1		0.2		17.2					1					1
13200 - 6952 - MAIN ST @ VINE ST	0		0		17.2					1					1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	2.2		1.2		18.2					1					1
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		18.2					1					1
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		18.2					1					1
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		18.2					1					1
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		18.2					1					1
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		18.2					1					1
16000 - 6958 - 104 MAIN ST	0.2		0		18.4					1					1
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		18.4					1					1
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		18.4					1					1
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		18.4					1					1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	13:10 (134.3) [5] !Fall 2012!					13:10 (134.6) [5] !Fall 2012!					14:05 (134.12) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		18.4	1.8		0		2.8	1		0		2
18000 - 9146 - 578 WINTHROP ST.	0		0		18.4	0.1		0.1		2.8	0		0		2
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0.4		0		18.8	2.6		0		5.4	1.5		0		3.5
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		18.8	0.5		0.1		5.8	0.1		0		3.6
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		18.8	0		0		5.8	0.1		0		3.7
19600 - 5008 - 300 WINTHROP ST	0		0		18.8	0.2		0		6	0		0		3.7
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.6		0.2		19.2	0.8		0		6.8	0.6		0		4.3
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.2		0		19.4	0.2		0		7	1.4		0.1		5.6
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		19.4	0.6		0.5		7.1	0.9		0.5		6
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					19.4					7.1					6
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	4		1.4		22	6.9		1.2		12.8	3.4		0.4		9
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	2		0.2		23.8	0.9		0.1		13.6	1.1		0		10.1
22400 - 9152 - 163 RIVERSIDE AVE	0		0		23.8	0.3		0		13.9	0		0		10.1
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.2		0.2		23.8	0.2		0		14.1	0.4		0.1		10.4
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.4		0		24.2	1.5		0.3		15.3	0.1		0.2		10.3
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		24.2	0.3		0.3		15.3	0.9		0.4		10.8
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.8		0		25	0.4		1		14.7	0.2		0.2		10.8
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.6		0.4		25.2	0.2		0.2		14.7	0.4		0		11.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					25.2					14.7	0		0.1		11.1
26000 - 49157 - 61 LOCUST ST	0.8		0.8		25.2	0.5		1.4		13.8					11.1
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	4.8		1.4		28.6	7.3		2.2		18.9	4.8		2.9		13
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.2		0		28.8	0.3		0		19.2	0.5		0.1		13.4
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		28.8	0		0		19.2	0.1		0		13.5
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0.2		28.6	0.1		0.2		19.1	0.1		0		13.6
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0.4		2		27	0.1		3.2		16	0		1.1		12.5
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		0		27	0.2		0.2		16	0.4		0.2		12.7
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.6		0.6		28	0.8		0.4		16.4	0.2		0.4		12.5
29200 - 5271 - WELLINGTON STATION BUSWAY	0		26		2	0		15.6		0.8	0		12.1		0.4
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					2					0.8					0.4
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					2					0.8					0.4
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					2					0.8					0.4
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					2					0.8					0.4
Maximum				2	28.8				1	19.2				1	13.6
Total	37.8		37.8		28.8	26.8		26.8		19.2	18.2		18.8		13

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	14:10 (134.1) [2] !Fall 2012!					14:25 (134.4) [10] !Fall 2012!					14:30 (134.4) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	2.5	1	0		3.5		1			1		1			1
800 - 8853 - 1076 MAIN ST	0		0		3.5					1					1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		3.5					1					1
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		3.5					1					1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		3.5					1					1
2400 - 8857 - 940 MAIN ST	0		0		3.5					1					1
2800 - 8858 - MAIN ST @ NICHOLS ST	0.5		0		4					1					1
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI	0.5		0		4.5					1					1
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		4.5					1					1
4000 - 8861 - ELM ST @ WARD ST	0.5		0		5					1					1
4400 - 8862 - ELM ST @ WEST ST	0.5		0		5.5					1					1
4800 - 8863 - ELM ST @ MONUMENT	1		0		6.5					1					1
5200 - 10016 - TRADECENTER 128					6.5					1					1
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	2		0.5		8					1					1
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		8					1					1
6400 - 8866 - MAIN ST @ EATON AVE	0		0		8					1					1
6800 - 8867 - 646 MAIN ST	0		0		8					1					1
7200 - 8868 - MAIN ST @ CHARLES ST	0		0		8					1					1
7600 - 8869 - MAIN ST @ KILBY ST	1		0		9					1					1
8000 - 8870 - 466 MAIN ST OPP UNION ST	2.5		0.5		11					1					1
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	2.5		0.5		13					1					1
8800 - 6941 - MAIN ST @ MYRTLE ST	0		0		13					1					1
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0		0		13					1					1
9600 - 6943 - MAIN ST @ WARREN AVE	0.5		0		13.5					1					1
10000 - 6944 - MAIN ST @ RICHARDSON ST	0		0		13.5					1					1
10400 - 6945 - 96 MAIN ST	0.5		0		14					1					1
10800 - 6946 - MAIN ST @ LYDON CT	1		0.5		14.5					1					1
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	1		0		15.5					1					1
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0		0		15.5					1					1
12000 - 6949 - MAIN ST @ CANAL ST	1.5		0		17					1					1
12400 - 6950 - MAIN ST @ CLARK ST	0.5		0		17.5					1					1
12800 - 6951 - MAIN ST @ LAKE ST	2		0.5		19					1					1
13200 - 6952 - MAIN ST @ VINE ST	0		0		19					1					1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	3		0.5		21.5					1					1
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		21.5					1					1
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		21.5					1					1
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		21.5					1					1
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		21.5					1					1
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0.5		0		22					1					1
16000 - 6958 - 104 MAIN ST	0		0		22					1					1
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		22					1					1
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		22					1					1
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		22					1					1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	14:10 (134.1) [2] !Fall 2012!					14:25 (134.4) [10] !Fall 2012!					14:30 (134.4) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0.5		0		22.5					1					1
18000 - 9146 - 578 WINTHROP ST.	0		0		22.5					1					1
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	11		2		31.5	39.1		0		40.1	32.5		0		33.5
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		31.5	0		0.3		39.8	0		0		33.5
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		31.5	0		0		39.8	0		0		33.5
19600 - 5008 - 300 WINTHROP ST	0		0		31.5	0		0.1		39.7	0		0		33.5
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		31.5	0.2		0.1		39.8	0		0		33.5
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.5		0		32	0.3		1.1		39	0		0.2		33.3
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		1.5		30.5	0.3		1.1		38.2	0.2		1.3		32.2
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					30.5					38.2					32.2
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	1		2		29.5	1.5		1.8		37.9	0.3		1.8		30.7
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	2		0		31.5	0.1		0		38	0.2		0.3		30.6
22400 - 9152 - 163 RIVERSIDE AVE	0		0		31.5	0.1		0.7		37.4	0.2		0.2		30.6
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.5		0.5		31.5	0.1		1.8		35.7	0.2		1		29.8
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		31.5	0.1		1.5		34.3	0		2.7		27.1
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.5		0		32	0.1		3		31.4	0		1		26.1
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	1		1		32	0		6.9		24.5	0.2		6.8		19.5
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.5		0		32.5	0		4.6		19.9	0.2		2.2		17.5
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					32.5					19.9					17.5
26000 - 49157 - 61 LOCUST ST	2.5		1.5		33.5					19.9					17.5
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	6		5		34.5					19.9					17.5
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.5		0		35	0		0.4		19.5	0		0.7		16.8
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		35	0		0.9		18.6	0		0.3		16.5
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		35	0		3.4		15.2	0		1		15.5
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		2.5		32.5	0.1		4.5		10.8	0		3.7		11.8
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		1.5		32					10.8					11.8
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		32					10.8					11.8
29200 - 5271 - WELLINGTON STATION BUSWAY	0		31		1					10.8					11.8
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					1	0		3.8		7	0		1.5		10.3
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					1	0		2.6		4.4	0		4.3		6
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					1	0		0.9		3.5	0		2.5		3.5
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					1	0		2.5		1	0		2.3		1.2
Maximum				1	35				1	40.1				1	33.5
Total	51.5		51.5		35	42		42		40.1	33.8		33.8		33.5

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	14:40 (134.4) [5] !Fall 2012!					15:10 (134.2) [4] !Fall 2012!					15:10 (134.6) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1	1	3	0		4		2			2
800 - 8853 - 1076 MAIN ST					1	0		0		4					2
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1	2		0		6					2
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1	0.8		0		6.8					2
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1	0.8		0		7.6					2
2400 - 8857 - 940 MAIN ST					1	0		0		7.6					2
2800 - 8858 - MAIN ST @ NICHOLS ST					1	1.8		0		9.4					2
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1	2		0		11.4					2
3600 - 8860 - ELM ST @ TRAVERSE ST					1	0.5		0		11.9					2
4000 - 8861 - ELM ST @ WARD ST					1	0		0		11.9					2
4400 - 8862 - ELM ST @ WEST ST					1	0		0		11.9					2
4800 - 8863 - ELM ST @ MONUMENT					1	1.5		0		13.4					2
5200 - 10016 - TRADECENTER 128					1	4.5		0		17.9					2
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1	2.3		0		20.2					2
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1	0		0		20.2					2
6400 - 8866 - MAIN ST @ EATON AVE					1	1.5		0.5		21.2					2
6800 - 8867 - 646 MAIN ST					1	0		0.3		20.9					2
7200 - 8868 - MAIN ST @ CHARLES ST					1	0.5		0		21.4					2
7600 - 8869 - MAIN ST @ KILBY ST					1	0.3		0		21.7					2
8000 - 8870 - 466 MAIN ST OPP UNION ST					1	2		1.8		21.9					2
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1	3		1.3		23.6					2
8800 - 6941 - MAIN ST @ MYRTLE ST					1	0.5		0.3		23.8					2
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1	0		0.5		23.3					2
9600 - 6943 - MAIN ST @ WARREN AVE					1	0		0.3		23					2
10000 - 6944 - MAIN ST @ RICHARDSON ST					1	0		0		23					2
10400 - 6945 - 96 MAIN ST					1	1.3		0.5		23.8					2
10800 - 6946 - MAIN ST @ LYDON CT					1	0		0		23.8					2
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1	0		0		23.8					2
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1	0		0		23.8					2
12000 - 6949 - MAIN ST @ CANAL ST					1	0.5		0		24.3					2
12400 - 6950 - MAIN ST @ CLARK ST					1	1		0		25.3					2
12800 - 6951 - MAIN ST @ LAKE ST					1	0.8		0		26.1					2
13200 - 6952 - MAIN ST @ VINE ST					1	0.3		0		26.4					2
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1	3.5		1		28.9					2
14000 - 6953 - MAIN ST @ WASHINGTON ST					1	0		0		28.9					2
14400 - 6954 - MAIN ST @ MYSTIC AVE					1	0		0		28.9					2
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1	0		0		28.9					2
15200 - 6956 - MAIN ST @ W MADISON AVE					1	0		0		28.9					2
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1	0		0		28.9					2
16000 - 6958 - 104 MAIN ST					1	0		0		28.9					2
16400 - 6959 - MAIN ST @ GATEWAY S					1	0		0		28.9					2
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1	0.3		0		29.2					2
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1	0.5		0.3		29.4					2

Massachusetts Bay Transportation Authority
Route 134
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	14:40 (134.4) [5] !Fall 2012!					15:10 (134.2) [4] !Fall 2012!					15:10 (134.6) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD					1	0.8		0.3		29.9	1.9		0		3.9
18000 - 9146 - 578 WINTHROP ST.					1	0		0.3		29.6	0		0		3.9
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	22.4		0		23.4	12.5		1		41.1	15.1		0.1		18.9
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0.2		23.2	0.5		0		41.6	0.3		0.1		19.1
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		23.2	0		0		41.6	0		0		19.1
19600 - 5008 - 300 WINTHROP ST	0		0		23.2	0		0		41.6	1.3		0.1		20.3
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		23.2	0		0.8		40.8	0.6		0.1		20.8
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0.8		22.4	0		0		40.8	0.4		0.2		21
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		1.2		21.2	0.8		2.3		39.3	0.6		3.3		18.3
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					21.2					39.3					18.3
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	0		1.2		20	5.3		5		39.6	5.5		4.5		19.3
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		20	1.3		1		39.9	0.4		0.2		19.5
22400 - 9152 - 163 RIVERSIDE AVE	0		0.2		19.8	0		0		39.9	0.1		0.4		19.2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0.8		19	0		0.3		39.6	0.1		0.9		18.4
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		1.4		17.6	0.8		0.3		40.1	0.5		0.9		18
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		1.8		15.8	0		0.8		39.3	0.2		0.4		17.8
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		2		13.8	1		1.3		39	1.2		2		17
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		3.8		10	0.5		0.8		38.7	0.2		1.5		15.7
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					10					38.7					15.7
26000 - 49157 - 61 LOCUST ST					10	0.5		1.5		37.7	1.1		2.3		14.5
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA					10	6.3		3.8		40.2	8.2		1.6		21.1
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		1.6		8.4	0.8		0		41	0.8		0		21.9
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0.2		8.2	0.3		0		41.3	0		0		21.9
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		8.2	0		0		41.3	0.3		0.2		22
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		3		5.2	0		2.5		38.8	0.1		1.8		20.3
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE					5.2	1		0		39.8	0.6		0.8		20.1
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE					5.2	0.5		0.5		39.8	0.9		1.4		19.6
29200 - 5271 - WELLINGTON STATION BUSWAY					5.2	0		36.3		3.5	0		17.2		2.4
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE	0		0.8		4.4					3.5					2.4
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE	0		0.6		3.8					3.5					2.4
30400 - 9048 - MIDDLESEX AVE @ THIRD ST	0		0.2		3.6					3.5					2.4
30800 - 9049 - MIDDLESEX AVE @ FIRST ST	0		2.6		1					3.5					2.4
Maximum				1	23.4				3	41.6				2	22
Total	22.4		22.4		23.4	65.3		64.8		42.1	40.4		40.1		22.3

Massachusetts Bay Transportation Authority
Route 134
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	16:00 (134.12) [8] !Fall 2012!					16:10 (134.3) [8] !Fall 2012!					16:20 (134.12) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		0			0	2.3	0	0		2.3		0			0
800 - 8853 - 1076 MAIN ST					0	0		0		2.3					0
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					0	0		0		2.3					0
1600 - 8855 - MAIN ST @ MOUNTAIN ST					0	0		0		2.3					0
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					0	0.1		0		2.4					0
2400 - 8857 - 940 MAIN ST					0	0		0		2.4					0
2800 - 8858 - MAIN ST @ NICHOLS ST					0	0.8		0		3.2					0
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					0					3.2					0
3600 - 8860 - ELM ST @ TRAVERSE ST					0	0		0		3.2					0
4000 - 8861 - ELM ST @ WARD ST					0	0		0		3.2					0
4400 - 8862 - ELM ST @ WEST ST					0	0		0		3.2					0
4800 - 8863 - ELM ST @ MONUMENT					0	3.6		0		6.8					0
5200 - 10016 - TRADECENTER 128					0	2.8		0		9.6					0
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					0	3		0		12.6					0
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					0	0		0		12.6					0
6400 - 8866 - MAIN ST @ EATON AVE					0	0.6		0		13.2					0
6800 - 8867 - 646 MAIN ST					0	0		0		13.2					0
7200 - 8868 - MAIN ST @ CHARLES ST					0	0		0		13.2					0
7600 - 8869 - MAIN ST @ KILBY ST					0	0		0		13.2					0
8000 - 8870 - 466 MAIN ST OPP UNION ST					0	3		1.3		14.9					0
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					0	2.1		0.5		16.5					0
8800 - 6941 - MAIN ST @ MYRTLE ST					0	0.5		0.1		16.9					0
9200 - 6942 - 226 MAIN ST OPP GREEN ST					0	0.8		0.5		17.2					0
9600 - 6943 - MAIN ST @ WARREN AVE					0	0.9		0.1		18					0
10000 - 6944 - MAIN ST @ RICHARDSON ST					0	0		0.1		17.9					0
10400 - 6945 - 96 MAIN ST					0	0.3		0		18.2					0
10800 - 6946 - MAIN ST @ LYDON CT					0	0.6		0.5		18.3					0
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					0	0		0		18.3					0
11600 - 6948 - MAIN ST @ HEMINGWAY ST					0	1		0		19.3					0
12000 - 6949 - MAIN ST @ CANAL ST					0	1.4		0.3		20.4					0
12400 - 6950 - MAIN ST @ CLARK ST					0	0.4		0.1		20.7					0
12800 - 6951 - MAIN ST @ LAKE ST					0	0.5		0.5		20.7					0
13200 - 6952 - MAIN ST @ VINE ST					0	0		0		20.7					0
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					0	4.8		0.6		24.9					0
14000 - 6953 - MAIN ST @ WASHINGTON ST					0	0		0		24.9					0
14400 - 6954 - MAIN ST @ MYSTIC AVE					0	0		0		24.9					0
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					0	0.1		0		25					0
15200 - 6956 - MAIN ST @ W MADISON AVE					0	0		0		25					0
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					0	0.3		0		25.3					0
16000 - 6958 - 104 MAIN ST					0	0		0		25.3					0
16400 - 6959 - MAIN ST @ GATEWAY S					0	0		0.1		25.2					0
16800 - 6960 - WINTHROP ST @ ROBINSON RD					0	0		0		25.2					0
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					0	0		0		25.2					0

Massachusetts Bay Transportation Authority
Route 134
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	16:00 (134.12) [8] !Fall 2012!					16:10 (134.3) [8] !Fall 2012!					16:20 (134.12) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	2.4		0		2.4	0		0.8		24.4	1.3		0		1.3
18000 - 9146 - 578 WINTHROP ST.	0		0		2.4	0		0.3		24.1	0		0		1.3
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	11.8		0		14.2	1.5		0.3		25.3	5.5		0.1		6.7
18800 - 9149 - WINTHROP ST @ EXETER ST	1.5		0		15.7	0.1		0		25.4	0.2		0		6.9
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.1		0		15.8	0.1		0		25.5	0.1		0		7
19600 - 5008 - 300 WINTHROP ST	0		0		15.8	0		0.3		25.2	0.2		0		7.2
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.6		0.1		16.3	0		0		25.2	0.2		0.1		7.3
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.3		0.5		16.1	0		0.1		25.1	0		0.4		6.9
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.9		2.5		14.5	0.1		1.5		23.7	0.6		0.9		6.6
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					14.5					23.7					6.6
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3.1		3.4		14.2	3.9		2.8		24.8	3.3		1.3		8.6
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.8		0.4		14.6	0.6		0.1		25.3	0.6		0		9.2
22400 - 9152 - 163 RIVERSIDE AVE	0		0		14.6	0		0		25.3	0.1		0.1		9.2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.3		1		13.9	0.1		0.1		25.3	0.1		0.7		8.6
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.3		0.1		14.1	0		0.1		25.2	0.2		0.1		8.7
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.3		0.6		13.8	0.1		0.4		24.9	0		0.5		8.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.5		1.4		12.9	0.3		0.6		24.6	0.5		0.3		8.4
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.1		1.4		11.6	0.3		0.4		24.5	0		0.2		8.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE	0		0		11.6					24.5	0		0.4		7.8
26000 - 49157 - 61 LOCUST ST					11.6	0		0.8		23.7					7.8
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	8.3		1		18.9	2.1		3		22.8	5.1		1.5		11.4
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.3		0.1		19.1	0.9		0.3		23.4	0.1		0		11.5
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.3		0.6		18.8	0.3		0.3		23.4	0.1		0.1		11.5
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		18.8	0		0		23.4	0.2		0.4		11.3
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0.5		1.5		17.8	0.1		1		22.5	0		0.8		10.5
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.9		0.1		18.6	0.4		0.5		22.4	1.5		0.4		11.6
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1.4		1.6		18.4	0.3		0.5		22.2	0.7		0.5		11.8
29200 - 5271 - WELLINGTON STATION BUSWAY	0		16.9		1.5	0		22.1		0.1	0		11.6		0.2
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					1.5					0.1					0.2
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					1.5					0.1					0.2
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					1.5					0.1					0.2
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					1.5					0.1					0.2
Maximum				0	19.1				0	25.5				0	11.8
Total	34.3		33.2		20.2	13		40.8		-2.3	20.5		20.2		12.1

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	17:00 (134.12) [8] !Fall 2012!					17:10 (134.3) [10] !Fall 2012!					17:17 (134.6) [6] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		0			0	0.4	0	0		0.4		0			0
800 - 8853 - 1076 MAIN ST					0	0		0		0.4					0
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					0	0		0		0.4					0
1600 - 8855 - MAIN ST @ MOUNTAIN ST					0	0		0		0.4					0
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					0	0.2		0		0.6					0
2400 - 8857 - 940 MAIN ST					0	0		0		0.6					0
2800 - 8858 - MAIN ST @ NICHOLS ST					0	1.3		0		1.9					0
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					0					1.9					0
3600 - 8860 - ELM ST @ TRAVERSE ST					0	0.7		0		2.6					0
4000 - 8861 - ELM ST @ WARD ST					0	0		0		2.6					0
4400 - 8862 - ELM ST @ WEST ST					0	0		0		2.6					0
4800 - 8863 - ELM ST @ MONUMENT					0	1.9		0		4.5					0
5200 - 10016 - TRADECENTER 128					0	3.9		0		8.4					0
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					0	0		0		8.4					0
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					0	1		0		9.4					0
6400 - 8866 - MAIN ST @ EATON AVE					0	0.5		0		9.9					0
6800 - 8867 - 646 MAIN ST					0	0.2		0		10.1					0
7200 - 8868 - MAIN ST @ CHARLES ST					0	0		0		10.1					0
7600 - 8869 - MAIN ST @ KILBY ST					0	0.5		0.1		10.5					0
8000 - 8870 - 466 MAIN ST OPP UNION ST					0	1.8		0.8		11.5					0
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					0	3.9		0.2		15.2					0
8800 - 6941 - MAIN ST @ MYRTLE ST					0	0.3		0		15.5					0
9200 - 6942 - 226 MAIN ST OPP GREEN ST					0	0.3		0		15.8					0
9600 - 6943 - MAIN ST @ WARREN AVE					0	1.1		0.1		16.8					0
10000 - 6944 - MAIN ST @ RICHARDSON ST					0	0		0		16.8					0
10400 - 6945 - 96 MAIN ST					0	0.7		0.3		17.2					0
10800 - 6946 - MAIN ST @ LYDON CT					0	0.3		0.2		17.3					0
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					0	0.9		0.1		18.1					0
11600 - 6948 - MAIN ST @ HEMINGWAY ST					0	0.2		0.3		18					0
12000 - 6949 - MAIN ST @ CANAL ST					0	0.7		0.1		18.6					0
12400 - 6950 - MAIN ST @ CLARK ST					0	0.3		0.3		18.6					0
12800 - 6951 - MAIN ST @ LAKE ST					0	0.7		0.3		19					0
13200 - 6952 - MAIN ST @ VINE ST					0	0		0		19					0
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					0	1.5		0.9		19.6					0
14000 - 6953 - MAIN ST @ WASHINGTON ST					0	0.1		0		19.7					0
14400 - 6954 - MAIN ST @ MYSTIC AVE					0	0		0		19.7					0
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					0	0		0		19.7					0
15200 - 6956 - MAIN ST @ W MADISON AVE					0	0.4		0		20.1					0
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					0	0.4		0.1		20.4					0
16000 - 6958 - 104 MAIN ST					0	0		0		20.4					0
16400 - 6959 - MAIN ST @ GATEWAY S					0	0		0.1		20.3					0
16800 - 6960 - WINTHROP ST @ ROBINSON RD					0	0		0		20.3					0
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					0	0		0		20.3					0

Massachusetts Bay Transportation Authority
Route 134
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(Urban Transportation Associates)

	17:00 (134.12) [8] !Fall 2012!					17:10 (134.3) [10] !Fall 2012!					17:17 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	2.5		0		2.5	0		0.3		20	0		0		0
18000 - 9146 - 578 WINTHROP ST.	0		0		2.5	0		0		20	0		0		0
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	1.9		0		4.4	1.9		0.1		21.8	0.7		0		0.7
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		4.4	0		0.3		21.5	0.3		0		1
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		4.4	0		0		21.5	0		0		1
19600 - 5008 - 300 WINTHROP ST	0.1		0		4.5	0.1		0		21.6	0		0		1
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		4.5	0.1		0.5		21.2	0.3		0		1.3
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.8		0		5.3	0.6		0.1		21.7	0		0.2		1.1
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0.4		4.9	0.1		0.6		21.2	0		0.2		0.9
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					4.9					21.2					0.9
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	4.5		0.3		9.1	2.6		1		22.8	3.3		0.2		4
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.9		0.1		9.9	0.4		0.5		22.7	0.2		0		4.2
22400 - 9152 - 163 RIVERSIDE AVE	0		0		9.9	0.2		0.2		22.7	0		0		4.2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.3		0.3		9.9	0.4		0.1		23	0		0		4.2
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.1		0		10	0		0.2		22.8	0.2		0		4.4
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0.8		9.2	0.2		1		22	0		0		4.4
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.3		1		8.5	0.3		1.3		21	0.2		0		4.6
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.1		0.4		8.2	0.1		0.4		20.7	0		0.3		4.3
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE	0		0.3		7.9					20.7					4.3
26000 - 49157 - 61 LOCUST ST					7.9	1		0.3		21.4	0.5		0.8		4
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	10.4		2.4		15.9	4.1		0.8		24.7	2		0.3		5.7
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.2		0.2		15.9	0.1		0		24.8	0.2		0		5.9
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		15.9	0		0		24.8	0.2		0		6.1
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		15.9	0		0.1		24.7	0		0		6.1
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.1		15.8	0		1.2		23.5	0		0.3		5.8
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		16.8	0.4		0.1		23.8	0.2		0.3		5.7
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.8		0.3		17.3	0.1		0.5		23.4	0		0.2		5.5
29200 - 5271 - WELLINGTON STATION BUSWAY	0		17.4		-0.1	0		23.6		-0.2	0		5.3		0.2
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					-0.1					-0.2					0.2
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					-0.1					-0.2					0.2
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					-0.1					-0.2					0.2
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					-0.1					-0.2					0.2
Maximum				0	17.3				0	24.8				0	6.1
Total	23.7		23.7		17.3	36.9		37.1		24.6	8.2		8.2		6.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	18:10 (134.5) [8] !Fall 2012!					18:10 (134.6) [8] !Fall 2012!					19:10 (134.5) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	2.5	2	0		4.5		1			1	1.5	5	0		6.5
800 - 8853 - 1076 MAIN ST	0		0		4.5					1	0		0		6.5
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		4.5					1	0		0		6.5
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		4.5					1	0		0		6.5
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		4.5					1	0		0		6.5
2400 - 8857 - 940 MAIN ST	0		0		4.5					1	0		0		6.5
2800 - 8858 - MAIN ST @ NICHOLS ST	0.6		0.1		5					1	1.2		0		7.7
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					5					1					7.7
3600 - 8860 - ELM ST @ TRAVERSE ST	0.3		0		5.3					1	0.2		0		7.9
4000 - 8861 - ELM ST @ WARD ST	0		0		5.3					1	0		0		7.9
4400 - 8862 - ELM ST @ WEST ST	0.1		0		5.4					1	0		0		7.9
4800 - 8863 - ELM ST @ MONUMENT	2.8		0		8.2					1	2		0		9.9
5200 - 10016 - TRADECENTER 128					8.2					1					9.9
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		8.2					1	0		0		9.9
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		8.2					1	0		0		9.9
6400 - 8866 - MAIN ST @ EATON AVE	0		0		8.2					1	0		0		9.9
6800 - 8867 - 646 MAIN ST	1.1		0		9.3					1	0		0		9.9
7200 - 8868 - MAIN ST @ CHARLES ST	0.1		0		9.4					1	0.5		0		10.4
7600 - 8869 - MAIN ST @ KILBY ST	0.1		0		9.5					1	0		0		10.4
8000 - 8870 - 466 MAIN ST OPP UNION ST	1.5		0.6		10.4					1	1.1		0.2		11.3
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	1.8		0		12.2					1	3.5		0.1		14.7
8800 - 6941 - MAIN ST @ MYRTLE ST	0		0.3		11.9					1	0.2		0		14.9
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0.9		0		12.8					1	0.3		0.1		15.1
9600 - 6943 - MAIN ST @ WARREN AVE	0.5		0.1		13.2					1	0.3		0		15.4
10000 - 6944 - MAIN ST @ RICHARDSON ST	0.1		0		13.3					1	0.1		0.5		15
10400 - 6945 - 96 MAIN ST	0		0		13.3					1	0		0.1		14.9
10800 - 6946 - MAIN ST @ LYDON CT	0.3		0.6		13					1	0.1		0		15
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0.1		0.3		12.8					1	0		0		15
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0.1		0		12.9					1	0		0		15
12000 - 6949 - MAIN ST @ CANAL ST	1.8		0		14.7					1	0.1		0		15.1
12400 - 6950 - MAIN ST @ CLARK ST	0		0		14.7					1	0		0		15.1
12800 - 6951 - MAIN ST @ LAKE ST	0.1		0		14.8					1	0		0		15.1
13200 - 6952 - MAIN ST @ VINE ST	0.8		0.6		15					1	0		0		15.1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	2.5		0.4		17.1					1	1.7		0.6		16.2
14000 - 6953 - MAIN ST @ WASHINGTON ST	0.3		0.1		17.3					1	0.1		0		16.3
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		17.3					1	0		0		16.3
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		17.3					1	0		0		16.3
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		17.3					1	0.1		0		16.4
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0.3		0		17.6					1	0		0		16.4
16000 - 6958 - 104 MAIN ST	0		0.3		17.3					1	0		0		16.4
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		17.3					1	0		0		16.4
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		17.3					1	0		0		16.4
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		17.3					1	0.2		0		16.6

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	18:10 (134.5) [8] !Fall 2012!					18:10 (134.6) [8] !Fall 2012!					19:10 (134.5) [11] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		17.3	1		0		2	0.4		0.2		16.8
18000 - 9146 - 578 WINTHROP ST.	0		0		17.3	0		0		2	0		0		16.8
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	1		0.3		18	3.8		0.3		5.5	0.7		0		17.5
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		18	0		0		5.5	0		0		17.5
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0.6		0		18.6	0.5		0		6	0		0		17.5
19600 - 5008 - 300 WINTHROP ST	0.3		0.1		18.8	0.2		0		6.2	0.4		0		17.9
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		18.8	0.2		0		6.4	0.2		0		18.1
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0.3		0		19.1	0		0.3		6.1	0.1		0		18.2
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.4		2.5		17	0.2		0.7		5.6	0.6		0.9		17.9
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					17					5.6					17.9
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	2.5		1		18.5	4.3		1.2		8.7	2.3		0.5		19.7
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.3		0		18.8	0.2		0.3		8.6	0.2		0		19.9
22400 - 9152 - 163 RIVERSIDE AVE	0		0		18.8	0		0		8.6	0		0		19.9
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0.4		18.4	0.2		0.2		8.6	0.1		1		19
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.3		0.8		17.9	0.2		0		8.8	0		0		19
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.4		0.8		17.5	0		0		8.8	0.4		0.2		19.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0.4		17.1	0.3		1.2		7.9	0.6		0.5		19.3
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.4		0.8		16.7	0.2		0		8.1	0		0.2		19.1
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					16.7					8.1					19.1
26000 - 49157 - 61 LOCUST ST	0.1		0.3		16.5	0.2		0.5		7.8	0.5		1.3		18.3
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	3.3		0.5		19.3	4.3		1.2		10.9	6.8		1.2		23.9
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.1		0		19.4	0.8		0		11.7	0.2		0		24.1
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		19.4	0		0		11.7	0.1		0		24.2
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		19.4	0		0		11.7	0.1		0.1		24.2
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.6		18.8	0		0		11.7	0		0.8		23.4
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.9		0.6		19.1	0.5		0.5		11.7	0.8		0.1		24.1
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0.3		18.8	0.3		1.2		10.8	0.2		0.5		23.8
29200 - 5271 - WELLINGTON STATION BUSWAY	0		16.6		2.2	0		10.2		0.6	0		18.6		5.2
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					2.2					0.6					5.2
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					2.2					0.6					5.2
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					2.2					0.6					5.2
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					2.2					0.6					5.2
Maximum				2	19.4				1	11.7				5	24.2
Total	29.1		29.1		19.4	17.3		17.7		11.3	27.6		27.6		24.2

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	20:00 (134.5) [8] !Fall 2012!					20:15 (134.7) [12] !Fall 2012!					21:15 (134.7) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	1	2	0		3		1			1		4			4
800 - 8853 - 1076 MAIN ST	0		0		3					1					4
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		3					1					4
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		3					1					4
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		3					1					4
2400 - 8857 - 940 MAIN ST	0		0		3					1					4
2800 - 8858 - MAIN ST @ NICHOLS ST	0.1		0.1		3					1					4
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					3					1					4
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		3					1					4
4000 - 8861 - ELM ST @ WARD ST	0		0		3					1					4
4400 - 8862 - ELM ST @ WEST ST	0		0		3					1					4
4800 - 8863 - ELM ST @ MONUMENT	2.3		0		5.3					1					4
5200 - 10016 - TRADECENTER 128					5.3					1					4
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		5.3					1					4
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0.3		0		5.6					1					4
6400 - 8866 - MAIN ST @ EATON AVE	0.4		0		6					1					4
6800 - 8867 - 646 MAIN ST	0		0		6					1					4
7200 - 8868 - MAIN ST @ CHARLES ST	0.4		0		6.4					1					4
7600 - 8869 - MAIN ST @ KILBY ST	0.4		0		6.8					1					4
8000 - 8870 - 466 MAIN ST OPP UNION ST	0.1		0.1		6.8					1					4
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	3		0		9.8					1					4
8800 - 6941 - MAIN ST @ MYRTLE ST	0.3		0		10.1					1					4
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0.1		0		10.2					1					4
9600 - 6943 - MAIN ST @ WARREN AVE	1.9		0		12.1					1					4
10000 - 6944 - MAIN ST @ RICHARDSON ST	0		0		12.1					1					4
10400 - 6945 - 96 MAIN ST	0		0		12.1					1					4
10800 - 6946 - MAIN ST @ LYDON CT	0		0		12.1					1					4
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0		0.4		11.7					1					4
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0.1		0		11.8					1					4
12000 - 6949 - MAIN ST @ CANAL ST	0		0		11.8					1					4
12400 - 6950 - MAIN ST @ CLARK ST	0		0		11.8					1					4
12800 - 6951 - MAIN ST @ LAKE ST	0.6		0.1		12.3					1					4
13200 - 6952 - MAIN ST @ VINE ST	0		0.3		12					1					4
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.6		0		12.6					1					4
14000 - 6953 - MAIN ST @ WASHINGTON ST	0.3		0.1		12.8					1					4
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		12.8					1					4
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		12.8					1					4
15200 - 6956 - MAIN ST @ W MADISON AVE	0.6		0		13.4					1					4
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		13.4					1					4
16000 - 6958 - 104 MAIN ST	0		0		13.4					1					4
16400 - 6959 - MAIN ST @ GATEWAY S	0.1		0		13.5					1					4
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		13.5					1					4
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		13.5					1					4

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	20:00 (134.5) [8] !Fall 2012!					20:15 (134.7) [12] !Fall 2012!					21:15 (134.7) [11] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		13.5					1					4
18000 - 9146 - 578 WINTHROP ST.	0		0		13.5					1					4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		13.5					1					4
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		13.5					1					4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		13.5					1					4
19600 - 5008 - 300 WINTHROP ST	0		0		13.5					1					4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.3		0		13.8					1					4
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		13.8					1					4
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.4		0.5		13.7					1					4
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					13.7	0.1		0		1.1	1.2		0		5.2
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	0.5		1.1		13.1	1.6		0.6		2.1	1.2		1.8		4.6
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0.1		0		13.2	0		0		2.1					4.6
22400 - 9152 - 163 RIVERSIDE AVE	0		0		13.2	0		0		2.1	0		0		4.6
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		13.2	0.2		0		2.3	0.3		0		4.9
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.3		0.4		13.1	0.1		0		2.4	0.5		0.2		5.2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0.3		0		13.4	0.3		0		2.7	0.4		0.3		5.3
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0.3		13.1	0		0		2.7	0		0		5.3
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		13.1	0		0		2.7	0		0.1		5.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					13.1					2.7					5.2
26000 - 49157 - 61 LOCUST ST	0		0		13.1	0.4		0.2		2.9	1.8		0.3		6.7
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.6		0.4		13.3	4.8		0		7.7	5.6		0.1		12.2
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		13.3	0		0.2		7.5	0		0		12.2
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		13.3	0.1		0		7.6	0		0		12.2
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		13.3	0		0		7.6	0.2		0		12.4
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		13.3	0		0.2		7.4	0		0.7		11.7
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.3		0		13.6	1.8		0.1		9.1	1.2		0		12.9
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.1		0		13.7	0		0		9.1	0.3		0		13.2
29200 - 5271 - WELLINGTON STATION BUSWAY	0		11.5		2.2	0		8		1.1	0		10.4		2.8
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					2.2					1.1					2.8
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					2.2					1.1					2.8
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					2.2					1.1					2.8
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					2.2					1.1					2.8
Maximum				2	13.8				1	9.1				4	13.2
Total	15.3		15.3		13.8	9.2		9.2		9.1	12.7		13.8		12.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

	22:15 (134.7) [12] !Fall 2012!					23:15 (134.7) [12] !Fall 2012!					24:15 (134.7) [12] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
400 - 8852 - MAIN ST @ N MAPLE ST		3			3		3					2				18.6	0	65.6
800 - 8853 - 1076 MAIN ST					3											0.2	0	65.8
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					3											5.3	0	71.1
1600 - 8855 - MAIN ST @ MOUNTAIN ST					3											5	0	76.1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					3											2.6	0.1	78.6
2400 - 8857 - 940 MAIN ST					3											0	0	78.6
2800 - 8858 - MAIN ST @ NICHOLS ST					3											21.2	0.2	99.6
3200 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					3											2.5	0	102.1
3600 - 8860 - ELM ST @ TRAVERSE ST					3											7.6	0	109.7
4000 - 8861 - ELM ST @ WARD ST					3											4	0	113.7
4400 - 8862 - ELM ST @ WEST ST					3											5	0	118.7
4800 - 8863 - ELM ST @ MONUMENT					3											41.4	2.3	157.8
5200 - 10016 - TRADECENTER 128					3											21.1	0.9	178
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					3											7.6	0.6	185
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					3											1.5	0	186.5
6400 - 8866 - MAIN ST @ EATON AVE					3											4.4	0.9	190
6800 - 8867 - 646 MAIN ST					3											2.3	1.7	190.6
7200 - 8868 - MAIN ST @ CHARLES ST					3											3.3	0	193.9
7600 - 8869 - MAIN ST @ KILBY ST					3											8.1	0.2	201.8
8000 - 8870 - 466 MAIN ST OPP UNION ST					3											26.8	10.4	218.2
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					3											53.8	8.5	263.5
8800 - 6941 - MAIN ST @ MYRTLE ST					3											6.8	1.1	269.2
9200 - 6942 - 226 MAIN ST OPP GREEN ST					3											8.8	2.1	275.9
9600 - 6943 - MAIN ST @ WARREN AVE					3											12.4	1.1	287.2
10000 - 6944 - MAIN ST @ RICHARDSON ST					3											5.4	1	291.6
10400 - 6945 - 96 MAIN ST					3											10.2	2.1	299.7
10800 - 6946 - MAIN ST @ LYDON CT					3											14.5	2.7	311.5
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					3											2.4	1	312.9
11600 - 6948 - MAIN ST @ HEMINGWAY ST					3											2.9	2	313.8
12000 - 6949 - MAIN ST @ CANAL ST					3											13.6	1.6	325.8
12400 - 6950 - MAIN ST @ CLARK ST					3											5.6	1.1	330.3
12800 - 6951 - MAIN ST @ LAKE ST					3											9.8	3.4	336.7
13200 - 6952 - MAIN ST @ VINE ST					3											1.4	1.1	337
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					3											29.7	17.3	349.4
14000 - 6953 - MAIN ST @ WASHINGTON ST					3											0.9	0.2	350.1
14400 - 6954 - MAIN ST @ MYSTIC AVE					3											0.1	0	350.2
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					3											1	0.2	351
15200 - 6956 - MAIN ST @ W MADISON AVE					3											1.3	0.4	351.9
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					3											2.5	0.1	354.3
16000 - 6958 - 104 MAIN ST					3											0.2	0.3	354.2
16400 - 6959 - MAIN ST @ GATEWAY S					3											0.4	0.3	354.3
16800 - 6960 - WINTHROP ST @ ROBINSON RD					3											0.3	0	354.6
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					3											0.8	0.3	355.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	22:15 (134.7) [12] !Fall 2012!					23:15 (134.7) [12] !Fall 2012!					24:15 (134.7) [12] !Fall 2012!					Total		
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Load
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD					3											19.4	2.6	371.9
18000 - 9146 - 578 WINTHROP ST.					3											0.8	0.7	372
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED					3											174.4	4.3	542.1
18800 - 9149 - WINTHROP ST @ EXETER ST					3											4.5	1	545.6
19200 - 9150 - WINTHROP ST @ SUFFOLK ST					3											4.4	0.2	549.8
19600 - 5008 - 300 WINTHROP ST					3											3.6	1.3	552.1
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH					3											11.5	2.6	561
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD					3											9.7	4.2	566.5
20800 - 6324 - HIGH ST OPP GOVERNORS AVE					3											13.9	29.1	551.3
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0.7		0		3.7	1.8		0		2.2	0.9		0		1.3	5.6	0	557.7
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	1.5		0.7		4.5	0.5		0.7		0.8	0.6		0.3		1	110.9	49.1	617.7
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO					4.5											22.5	4.4	634
22400 - 9152 - 163 RIVERSIDE AVE	0.2		0		4.7	0		0		4.3	0		0		2.3	3.2	1.8	642
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.1		0.1		4.7	0.1		0		4	0		0		2.3	16.4	10	648
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0.5		0		5.2	0		0		4	0.1		0		2.3	23.6	13	658.5
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		5.2	0		0		4	0		0		2.3	12.8	13.6	657.7
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.4		0.1		5.5	0		0		4	0		0.3		2.1	32.4	31.3	658.9
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.3		0.3		5.5	0		0		4	0.4		0		2.5	13	20.7	651.2
25600 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					5.5											0	0.9	643.8
26000 - 49157 - 61 LOCUST ST	0.1		0		5.6	0.3		0.1		4.2	0.1		0.1		2.5	64.3	22.3	692.3
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	5		0.8		9.8	0.9		0		5.1	0		0		2.5	148.6	47.5	793.4
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.4		0		10.2	0		0		5.1	0		0		2.5	27.2	4.1	816.5
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.3		0		10.5	0.1		0		5.2	0		0		2.5	3.5	2.8	817.2
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		10.5	0.3		0		5.3	0		0		2.5	3.2	6.4	813.8
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0.3		0.1		10.7	0		0.1		5.3	0.2		0		2.7	2.8	38.1	778.6
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0.8		0		11.5	0.8		1		5.1	0		0.2		2.5	33.4	10.6	801.4
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.4		0.1		11.8	0.4		0.9		4.6	0		0.4		2.1	24.1	15.4	810.1
29200 - 5271 - WELLINGTON STATION BUSWAY	0		8.7		3.1	0		3.8		0.8	0		1.8		0.3	0	730.6	79.5
29600 - 49096 - RIVERSIDE AVE @ BRADBURY AVE					3.1											0	6.1	72.3
30000 - 9047 - RIVERSIDE AVE @ MIDDLESEX AVE					3.1											0	7.5	64.8
30400 - 9048 - MIDDLESEX AVE @ THIRD ST					3.1											0	3.6	61.2
30800 - 9049 - MIDDLESEX AVE @ FIRST ST					3.1											0	7.4	53.8
Maximum				3	11.8					5.3					2.7	0	0	905.4
Total	10.9		10.8		11.9	5.1		6.6			2.3		3			1130.4	1155.8	874.2

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
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(Urban Transportation Associates)

	05:20 (134.5) [11] !Fall 2012!					06:10 (134.5) [9] !Fall 2012!					06:35 (134.6) [5] !Fall 2012!					06:55 (134.4) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	2.5	0	0		2.5	34.6	0	0		34.6	10.4	0	0		10.4		1			1
800 - 9318 - CORPORATION WAY AFTER BRIDGE	2.5		0		5	0.4		0		35	1.6		0		12					1
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.5		4.5	0.9		0.1		35.8	0		0.4		11.6					1
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		4.5	0		0		35.8	0		0.4		11.2					1
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					4.5					35.8					11.2	9.7		0		10.7
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					4.5					35.8					11.2	0		0		10.7
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					4.5					35.8					11.2	4.4		0		15.1
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					4.5					35.8					11.2	9.4		0		24.5
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					4.5					35.8					11.2	1.3		0		25.8
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.1		0		4.6	0.6		0.2		36.2	1		0.2		12	2		0.1		27.7
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0		4.6	0		0.3		35.9	0.2		1		11.2	4		0		31.7
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		1.1		3.5	0		0.4		35.5	0		0		11.2	0		0		31.7
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0		3.5	0		0.2		35.3	0.2		0.4		11	0		0		31.7
3600 - 49157 - 61 LOCUST ST	1.5		0.2		4.8	0.1		2.6		32.8	1.4		0.2		12.2					31.7
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					4.8					32.8					12.2					31.7
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.1		0.6		4.3	0		0.3		32.5	0.2		3		9.4					31.7
4400 - 9165 - 350 RIVERSIDE AVE	0.3		0		4.6	0.1		0		32.6	2.6		1.4		10.6	5.3		0		37
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.7		0		5.3	0.2		0		32.8	9.4		0.6		19.4	1.3		0		38.3
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0.8		0		6.1	0		0		32.8	0		0		19.4	0.6		0.1		38.8
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0.1		6	0		0		32.8	1.2		0.2		20.4	2.6		0		41.4
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.1		0		6.1	0.9		0		33.7	2.6		0.2		22.8	6.7		0.1		48
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		6.1	0.1		0		33.8	0		0		22.8	0		0		48
6800 - 9172 - 116 RIVERSIDE AVE	0		0		6.1	0		0.4		33.4	0		0		22.8	0		0		48
7200 - 5002 - SALEM ST OPP RIVER ST	0		1.5		4.6	1.6		0.4		34.6	1.4		0.2		24	1.4		0.7		48.7
7600 - 15002 - HIGH ST @ BRADLEE RD	0		0.2		4.4	0.1		1.1		33.6	0.6		0.2		24.4	1		0.1		49.6
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0		4.4	0		0		33.6	0		0		24.4	0.1		0.1		49.6
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0		4.4	0		0		33.6	0		0		24.4	0		0		49.6
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		0		4.4	0.8		0.3		34.1	0		0.2		24.2	0		0		49.6
9200 - 5006 - 305 WINTHROP ST	0		0.9		3.5	0.7		0.4		34.4	0		0.2		24	0		0.1		49.5
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0.1		0		3.6	0		0		34.4	0		0		24	0		0.1		49.4
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		3.6	0		0		34.4	0		0.4		23.6	0		0		49.4
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0		3.6	0		0		34.4	0		0		23.6	0		48.1		1.3
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0		3.6	0		0.1		34.3	0.2		23.4		0.4					1.3
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		3.6	0		0		34.3	0		0		0.4					1.3
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		3.6	0.1		0		34.4	0		0.4		5.7E-15					1.3
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		3.6	0		0		34.4					5.7E-15					1.3
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		3.6	0		0		34.4					5.7E-15					1.3
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		3.6	0		0		34.4					5.7E-15					1.3
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		3.6	0		0		34.4					5.7E-15					1.3
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		3.6	0		0		34.4					5.7E-15					1.3
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		3.6	0		0		34.4					5.7E-15					1.3
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		3.6	0		0		34.4					5.7E-15					1.3
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		3.6	0		0		34.4					5.7E-15					1.3
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		3.6	0		0		34.4					5.7E-15					1.3

Massachusetts Bay Transportation Authority
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	05:20 (134.5) [11] !Fall 2012!					06:10 (134.5) [9] !Fall 2012!					06:35 (134.6) [5] !Fall 2012!					06:55 (134.4) [7] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.8		0.2		4.2	0.1		2.6		31.9					5.7E-15					1.3
16000 - 9111 - MAIN ST @ VINE ST	0		0		4.2	0		0.1		31.8					5.7E-15					1.3
16400 - 9113 - MAIN ST @ LAKE ST	0		0.1		4.1	0.1		0.4		31.5					5.7E-15					1.3
16800 - 9114 - 757 MAIN ST	0		0		4.1	0		1		30.5					5.7E-15					1.3
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.4		3.7	0.8		0.8		30.5					5.7E-15					1.3
17600 - 9116 - 955 MAIN ST	0		0		3.7	0		0		30.5					5.7E-15					1.3
18000 - 9117 - 995 MAIN ST	0		0		3.7	0		0		30.5					5.7E-15					1.3
18400 - 9118 - MAIN ST @ CRANES CT	0		0		3.7	1.1		1.2		30.4					5.7E-15					1.3
18800 - 9119 - MAIN ST @ VINING CT	0		0		3.7	0.2		0.8		29.8					5.7E-15					1.3
19200 - 9120 - MAIN ST @ RICHARDSON ST	0.5		0		4.2	0		0		29.8					5.7E-15					1.3
19600 - 9121 - MAIN ST @ FOWLE ST	0		0		4.2	0		0.3		29.5					5.7E-15					1.3
20000 - 9122 - MAIN ST @ GREEN ST	0		0		4.2	1		0.8		29.7					5.7E-15					1.3
20400 - 9123 - 275 MAIN ST	0		0		4.2	0		0.7		29					5.7E-15					1.3
20800 - 9124 - MAIN ST @ MONTVALE AVE	0.1		0.3		4	0.3		2.3		27					5.7E-15					1.3
21200 - 9127 - MAIN ST @ EVERETT ST	0		0.3		3.7	0		0.7		26.3					5.7E-15					1.3
21600 - 9128 - MAIN ST @ MANNING ST	0		0.1		3.6	0		0		26.3					5.7E-15					1.3
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0.5		3.1	0		1.1		25.2					5.7E-15					1.3
22400 - 9130 - MAIN ST @ PAGE PL	0		0		3.1	0		0		25.2					5.7E-15					1.3
22800 - 9131 - MAIN ST @ EATON AVE	0		0.3		2.8	0		2.6		22.6					5.7E-15					1.3
23200 - 9133 - MAIN ST @ FISHER TERR	0		0.6		2.2	0		2.1		20.5					5.7E-15					1.3
23600 - 10016 - TRADECENTER 128					2.2					20.5					5.7E-15					1.3
24000 - 9134 - ELM ST @ MONUMENT	0		0		2.2	0		5		15.5					5.7E-15					1.3
24400 - 9135 - 31 ELM ST	0		0.1		2.1	0		0		15.5					5.7E-15					1.3
24800 - 9136 - 53 ELM ST	0		0		2.1	0		0.3		15.2					5.7E-15					1.3
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0.9		1.2	0		0		15.2					5.7E-15					1.3
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1.2					15.2					5.7E-15					1.3
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0		1.2	0		1.9		13.3					5.7E-15					1.3
26400 - 9140 - 949 MAIN ST	0		0		1.2	0		0		13.3					5.7E-15					1.3
26800 - 9142 - 979 MAIN ST	0		0		1.2	0		1.6		11.7					5.7E-15					1.3
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		1.2	0		6.2		5.5					5.7E-15					1.3
27600 - 9144 - 1075 MAIN ST	0		0		1.2	0		0.2		5.3					5.7E-15					1.3
28000 - 8852 - MAIN ST @ N MAPLE ST	0		1.9	0	-0.7	0		5	0	0.3				0	5.7E-15				1	0.3
28040 - 45002 - MEDFORD SO @ CITY HALL PARKIN					-0.7					0.3					5.7E-15					0.3
Maximum					6.1					36.2					24.4					49.6
Total	10		10.5			44.8		44.8			33		33			49.9		49.9		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	07:10 (134.3) [5] !Fall 2012!					07:10 (134.4) [5] !Fall 2012!					07:25 (134.12) [8] !Fall 2012!					07:40 (134.12) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	28.2	0	0		28.2		1			1	10.1	0	0		10.1	6.5	0	0		6.5
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.8		0		29					1	0.1		0		10.2	0		0		6.5
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	1.2		0.6		29.6					1	0.8		0.5		10.5	0		0.1		6.4
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.2		29.4					1	0		0		10.5	0		0		6.4
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					29.4	5.8		0		6.8					10.5					6.4
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					29.4	2.4		0.3		8.9					10.5					6.4
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					29.4	4.3		0.1		13.1					10.5					6.4
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					29.4	2		0		15.1					10.5					6.4
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					29.4	0.3		0		15.4					10.5					6.4
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.2		0		29.6	1.3		0.1		16.6	0.6		0.3		10.8	0.3		0		6.7
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.2		1		28.8	2.6		0		19.2	0.1		0.5		10.4	0		0.4		6.3
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0.2		28.6	0		0		19.2					10.4					6.3
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0.6		0		29.2	1.1		0.1		20.2					10.4					6.3
3600 - 49157 - 61 LOCUST ST	0.8		4.4		25.6					20.2					10.4					6.3
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					25.6					20.2	0		0.8		9.6	0		0.1		6.2
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.6		0.6		26.6					20.2	0.8		3.1		7.3	0.1		1.3		5
4400 - 9165 - 350 RIVERSIDE AVE	1		0.2		27.4	8.7		0.2		28.7	0.5		1.1		6.7	0.1		0.9		4.2
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	1		0		28.4	10		0.5		38.2	0.9		0		7.6	0.4		0.1		4.5
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0		28.4	0.3		0		38.5	0		0		7.6	0		0		4.5
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0.8		0.4		28.8	4.4		0.1		42.8	1.4		0.1		8.9	0.4		0		4.9
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.4		0		29.2	4.8		0.2		47.4	0		0		8.9	0.1		0		5
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0.2		0		29.4	0.1		0		47.5	0		0		8.9	0		0		5
6800 - 9172 - 116 RIVERSIDE AVE	0		0.4		29	0.2		0.4		47.3	0		0.5		8.4	0		0.1		4.9
7200 - 5002 - SALEM ST OPP RIVER ST	2.4		1.4		30	1.9		0.9		48.3	2.3		2.6		8.1	0.4		2.1		3.2
7600 - 15002 - HIGH ST @ BRADLEE RD	0.8		0.2		30.6	0.7		0.2		48.8	0.5		0.4		8.2	0.5		0.8		2.9
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0.2		0		30.8	0		0		48.8	0		0		8.2	0.1		0.3		2.7
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0.4		30.4	0		0		48.8	0.1		0.6		7.7	0		0.1		2.6
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		0		30.4	0		0		48.8	0		1.1		6.6	0.1		0.4		2.3
9200 - 5006 - 305 WINTHROP ST	0		0		30.4	0		0		48.8	0		0		6.6	0		0		2.3
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		30.4	0.1		0		48.9	0		0		6.6	0.3		0.1		2.5
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		30.4	0		0		48.9	0		0		6.6	0		0		2.5
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0		30.4	0		47.9		1	0		0		6.6	0		0		2.5
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		6.4		24					1	0.1		5.4		1.3	0		1.3		1.2
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		24					1	0		0		1.3	0		0.3		0.9
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		24					1	0		1		0.3	0		0.8		0.1
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		24					1					0.3					0.1
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		24					1					0.3					0.1
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		24					1					0.3					0.1
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		24					1					0.3					0.1
13600 - 9105 - MAIN ST @ EVERELL RD	0		0.4		23.6					1					0.3					0.1
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		23.6					1					0.3					0.1
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0.2		23.4					1					0.3					0.1
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		23.4					1					0.3					0.1
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		23.4					1					0.3					0.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	07:10 (134.3) [5] !Fall 2012!					07:10 (134.4) [5] !Fall 2012!					07:25 (134.12) [8] !Fall 2012!					07:40 (134.12) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.6		0.6		23.4					1					0.3					0.1
16000 - 9111 - MAIN ST @ VINE ST	0.6		0		24					1					0.3					0.1
16400 - 9113 - MAIN ST @ LAKE ST	0.6		0		24.6					1					0.3					0.1
16800 - 9114 - 757 MAIN ST	0.4		0.2		24.8					1					0.3					0.1
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		1.2		23.6					1					0.3					0.1
17600 - 9116 - 955 MAIN ST	0		1.2		22.4					1					0.3					0.1
18000 - 9117 - 995 MAIN ST	0		0		22.4					1					0.3					0.1
18400 - 9118 - MAIN ST @ CRANES CT	0.4		1		21.8					1					0.3					0.1
18800 - 9119 - MAIN ST @ VINING CT	0		0.6		21.2					1					0.3					0.1
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.2		21					1					0.3					0.1
19600 - 9121 - MAIN ST @ FOWLE ST	0		0		21					1					0.3					0.1
20000 - 9122 - MAIN ST @ GREEN ST	1.8		3		19.8					1					0.3					0.1
20400 - 9123 - 275 MAIN ST	0		0.6		19.2					1					0.3					0.1
20800 - 9124 - MAIN ST @ MONTVALE AVE	1		2.6		17.6					1					0.3					0.1
21200 - 9127 - MAIN ST @ EVERETT ST	0.8		2.6		15.8					1					0.3					0.1
21600 - 9128 - MAIN ST @ MANNING ST	0		0		15.8					1					0.3					0.1
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0		15.8					1					0.3					0.1
22400 - 9130 - MAIN ST @ PAGE PL	0		0		15.8					1					0.3					0.1
22800 - 9131 - MAIN ST @ EATON AVE	0.2		1.6		14.4					1					0.3					0.1
23200 - 9133 - MAIN ST @ FISHER TERR	0		3.4		11					1					0.3					0.1
23600 - 10016 - TRADECENTER 128	0		0		11					1					0.3					0.1
24000 - 9134 - ELM ST @ MONUMENT	0		7.2		3.8					1					0.3					0.1
24400 - 9135 - 31 ELM ST	0		0.2		3.6					1					0.3					0.1
24800 - 9136 - 53 ELM ST	0		0		3.6					1					0.3					0.1
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0.6		3					1					0.3					0.1
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					3					1					0.3					0.1
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		1.4		1.6					1					0.3					0.1
26400 - 9140 - 949 MAIN ST	0		0		1.6					1					0.3					0.1
26800 - 9142 - 979 MAIN ST	0		0		1.6					1					0.3					0.1
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0.6		1					1					0.3					0.1
27600 - 9144 - 1075 MAIN ST	0		0		1					1					0.3					0.1
28000 - 8852 - MAIN ST @ N MAPLE ST	0		1	0	1E-14				1	0				0	0.3				0	0.1
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					1E-14					0					0.3					0.1
Maximum					30.8					48.9					10.8					6.7
Total	46.8		46.8			51		51			18.2		18			9.3		9		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	08:10 (134.3) [12] !Fall 2012!					08:40 (134.12) [5] !Fall 2012!					09:10 (134.3) [3] !Fall 2012!					09:40 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	19.6	1	0		20.6	9.8	1	0		10.8	11.4	2	0		13.4	8.6	2	0		10.6
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.1		0		20.7	0		0		10.8	0		0		13.4	0		0		10.6
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.7		0.5		20.9	0		0.4		10.4	0		1.7		11.7	0.5		0.8		10.3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.3		20.7	0		0.2		10.2	0.3		1		11	0.2		0.3		10.2
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					20.7					10.2					11					10.2
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					20.7					10.2					11					10.2
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					20.7					10.2					11					10.2
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					20.7					10.2					11					10.2
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					20.7					10.2					11					10.2
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.4		0.5		20.6	0.6		0		10.8	0.3		0		11.3	0.5		0.7		10
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.5		0.3		20.8	0		0.4		10.4	0.3		0.7		10.9	0		0.3		9.7
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0.2		20.6					10.4	0		0		10.9	0		0		9.7
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0.1		0.4		20.3					10.4	0		0		10.9	0		0		9.7
3600 - 49157 - 61 LOCUST ST	0.4		0.3		20.4					10.4	0		0.3		10.6	1		1.3		9.4
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					20.4	0		0.6		9.8					10.6					9.4
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.5		1.9		20	3.2		6.4		6.6	0.7		2.3		9	0.5		3		6.9
4400 - 9165 - 350 RIVERSIDE AVE	0.2		0		20.2	0		0.4		6.2	0.3		0.3		9	0		0.2		6.7
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.7		0.2		20.7	0.2		0.2		6.2	1		1.3		8.7	0.3		0.2		6.8
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0.3		0.3		20.7	0		0		6.2	0		0		8.7	0		0		6.8
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0.3		0		21	0		0.4		5.8	0.3		0		9	0.7		0.2		7.3
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.8		0.4		21.4	0.2		0		6	0		0		9	0		0		7.3
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		21.4	0.4		0		6.4	0		0		9	0		0.5		6.8
6800 - 9172 - 116 RIVERSIDE AVE	0		0.3		21.1	0		0		6.4	0.3		0.3		9	0		0.7		6.1
7200 - 5002 - SALEM ST OPP RIVER ST	2.5		2.3		21.3	0.8		1.8		5.4	1		2.3		7.7	0.3		1.8		4.6
7600 - 15002 - HIGH ST @ BRADLEE RD	1.9		0.6		22.6	0.4		0.2		5.6	0.3		0.7		7.3	0		0.2		4.4
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0.1		0.7		22	0		0.8		4.8	0		0.3		7	0		1.7		2.7
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0.1		0.1		22	0		0.8		4	0		0		7	0		0		2.7
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.1		0.5		21.6	0.2		0.6		3.6	0.7		0.3		7.4	0		0.5		2.2
9200 - 5006 - 305 WINTHROP ST	0		0		21.6	0		0		3.6	0		0		7.4	0		0		2.2
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0.5		21.1	0		0		3.6	0		0		7.4	0		0.2		2
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		21.1	0		0		3.6	0		0		7.4	0		0		2
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0.1		0		21.2	0		0.6		3	0		0		7.4	0		0		2
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		1.1		20.1	0		1.6		1.4	0		0.7		6.7	0		0.3		1.7
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		20.1	0		0.4		1	0		0		6.7	0		0		1.7
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0.8		0.3		20.6	0		0		1	0.7		0		7.4	0		1		0.7
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		20.6					1	0		0		7.4					0.7
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		20.6					1	0		0		7.4					0.7
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		20.6					1	0		0		7.4					0.7
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		20.6					1	0		0		7.4					0.7
13600 - 9105 - MAIN ST @ EVERELL RD	0		0.1		20.5					1	0		0.3		7.1					0.7
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0.1		20.4					1	0		0		7.1					0.7
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0.3		20.1					1	0		0		7.1					0.7
14800 - 9108 - MAIN ST @ PROSPECT ST	0.1		0.4		19.8					1	0		0.3		6.8					0.7
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		19.8					1	0		0		6.8					0.7

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	08:10 (134.3) [12] !Fall 2012!					08:40 (134.12) [5] !Fall 2012!					09:10 (134.3) [3] !Fall 2012!					09:40 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.3		3		17.1					1	2.3		0.3		8.8					0.7
16000 - 9111 - MAIN ST @ VINE ST	0		0.1		17					1	0.3		0		9.1					0.7
16400 - 9113 - MAIN ST @ LAKE ST	0.1		0.5		16.6					1	0		0.7		8.4					0.7
16800 - 9114 - 757 MAIN ST	0.2		1.4		15.4					1	0		0.3		8.1					0.7
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.8		14.6					1	0		2		6.1					0.7
17600 - 9116 - 955 MAIN ST	0		0.5		14.1					1	0		0.7		5.4					0.7
18000 - 9117 - 995 MAIN ST	0		1.2		12.9					1	0		0.7		4.7					0.7
18400 - 9118 - MAIN ST @ CRANES CT	0.2		0.1		13					1	0		0		4.7					0.7
18800 - 9119 - MAIN ST @ VINING CT	0		0.4		12.6					1	0		0.3		4.4					0.7
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.1		12.5					1	0		0.7		3.7					0.7
19600 - 9121 - MAIN ST @ FOWLE ST	0		0.2		12.3					1	0		0		3.7					0.7
20000 - 9122 - MAIN ST @ GREEN ST	0.4		0.4		12.3					1	0		1		2.7					0.7
20400 - 9123 - 275 MAIN ST	0.3		0.1		12.5					1	0		0		2.7					0.7
20800 - 9124 - MAIN ST @ MONTVALE AVE	0.1		1.7		10.9					1	1.3		3.7		0.3					0.7
21200 - 9127 - MAIN ST @ EVERETT ST	1.3		4		8.2					1	0.3		0.7		-0.1					0.7
21600 - 9128 - MAIN ST @ MANNING ST	0		0.4		7.8					1	0.3		0		0.2					0.7
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0.1		7.7					1	0		0		0.2					0.7
22400 - 9130 - MAIN ST @ PAGE PL	0		0.1		7.6					1	0		0.3		-0.1					0.7
22800 - 9131 - MAIN ST @ EATON AVE	0		0.2		7.4					1	0		0.3		-0.4					0.7
23200 - 9133 - MAIN ST @ FISHER TERR	0		0		7.4					1	0		1.3		-1.7					0.7
23600 - 10016 - TRADECENTER 128	0		0		7.4					1	0		1		-2.7					0.7
24000 - 9134 - ELM ST @ MONUMENT	0.3		4.9		2.8					1	0.7		2.3		-4.3					0.7
24400 - 9135 - 31 ELM ST	0		0.8		2					1	1.7		0.7		-3.3					0.7
24800 - 9136 - 53 ELM ST	0		0.1		1.9					1	0		0		-3.3					0.7
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0.4		1.5					1	0		0.7		-4					0.7
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					1.5					1					-4					0.7
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0.7		0.8					1	0		0		-4					0.7
26400 - 9140 - 949 MAIN ST	0		0.3		0.5					1	0		0		-4					0.7
26800 - 9142 - 979 MAIN ST	0		0.1		0.4					1	0		0		-4					0.7
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		0.4					1	0		0		-4					0.7
27600 - 9144 - 1075 MAIN ST	0		0		0.4					1	0		0		-4					0.7
28000 - 8852 - MAIN ST @ N MAPLE ST	0		1.3	1	-1.9				1	0	0		0.3	2	-6.3				2	-1.3
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					-1.9					0					-6.3					-1.3
Maximum					22.6					10.8					13.4					10.6
Total	34.2		35.8			15.8		15.8			24.7		31			12.6		13.8		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	10:10 (134.2) [11] !Fall 2012!					10:40 (134.12) [9] !Fall 2012!					11:10 (134.2) [3] !Fall 2012!					11:40 (134.6) [10] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	17.7	2	0		19.7	7.9	2	0		9.9	11.8	2	0		13.8	8.7	2	0		10.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.4		0		20.1	0.3		0		10.2	0.3		0		14.1	0.1		0		10.8
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		0.5		19.9	0		0.1		10.1	0		0.3		13.8	0		0.5		10.3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0.3		19.7	0		0.3		9.8	0		0		13.8	0.1		0.2		10.2
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					19.7					9.8					13.8					10.2
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					19.7					9.8					13.8					10.2
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					19.7					9.8					13.8					10.2
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					19.7					9.8					13.8					10.2
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					19.7					9.8					13.8					10.2
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.9		0.4		20.2	0.6		0		10.4	0		1.3		12.5	1.2		0.7		10.7
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0.1		20.1	0		0.3		10.1	0		1.7		10.8	0.2		0		10.9
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0.9		19.2					10.1	0		0		10.8	0		0		10.9
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0.1		0.3		19					10.1	0		0		10.8	0.1		0		11
3600 - 49157 - 61 LOCUST ST	0.4		1.1		18.3					10.1	0.7		1.3		10.2	0.6		2.9		8.7
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					18.3	0		0.3		9.8					10.2					8.7
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	2.2		2.7		17.8	1.7		4.7		6.8	0		5.3		4.9	1.2		5		4.9
4400 - 9165 - 350 RIVERSIDE AVE	0.2		0.7		17.3	0		0.3		6.5	0.7		0		5.6	0.1		0.4		4.6
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.2		0.3		17.2	0.1		0.2		6.4	0		0		5.6	0.1		0.5		4.2
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0.1		0		17.3	0.1		0		6.5	0.7		0		6.3	0.9		0.3		4.8
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0		17.3	0		0.1		6.4	0		0		6.3	0.2		0.5		4.5
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0		17.3	0		0		6.4	0		0		6.3	0		0.3		4.2
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		17.3	0		0		6.4	0		0		6.3	0		0.2		4
6800 - 9172 - 116 RIVERSIDE AVE	0.1		1.3		16.1	0		1.3		5.1	0		1		5.3	0		1.5		2.5
7200 - 5002 - SALEM ST OPP RIVER ST	0.5		2.4		14.2	0.2		0.9		4.4	1.7		1.7		5.3	0.5		3.3		-0.3
7600 - 15002 - HIGH ST @ BRADLEE RD	0.5		1.1		13.6	0		1.1		3.3	0		0		5.3	0		0.5		-0.8
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0.5		13.1	0		0.3		3	0		1		4.3	0.1		0.7		-1.4
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0.1		0.6		12.6	0		0		3	0		0.3		4	0		0.4		-1.8
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.4		0		13	0		0.1		2.9	0		0		4	0		0.5		-2.3
9200 - 5006 - 305 WINTHROP ST	0		0		13	0		0		2.9	0		0.3		3.7	0		0.5		-2.8
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0.1		12.9	0		0.1		2.8	0		0		3.7	0		0		-2.8
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		12.9	0		0		2.8	0		0		3.7	0		0.3		-3.1
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0		12.9	0		0		2.8	0		0		3.7	0		0.1		-3.2
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.5		12.4	0		0.1		2.7	0		0		3.7	0		0.4		-3.6
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0.3		12.1	0		0		2.7	0		0		3.7	0		0.1		-3.7
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0.3		0		12.4	0		1.1		1.6	0		0		3.7	0		0.2		-3.9
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		12.4					1.6	0		0		3.7					-3.9
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		12.4					1.6	0		0		3.7					-3.9
12800 - 9103 - MAIN ST @ TOWN WAY	0.1		0		12.5					1.6	0		0		3.7					-3.9
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0.1		0		12.6					1.6	0		0.3		3.4					-3.9
13600 - 9105 - MAIN ST @ EVERELL RD	0		0.1		12.5					1.6	0		0		3.4					-3.9
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0.1		12.4					1.6	0		0		3.4					-3.9
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		12.4					1.6	0		0		3.4					-3.9
14800 - 9108 - MAIN ST @ PROSPECT ST	0.1		0.3		12.2					1.6	0		0.3		3.1					-3.9
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		12.2					1.6	0		0		3.1					-3.9

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	10:10 (134.2) [11] !Fall 2012!					10:40 (134.12) [9] !Fall 2012!					11:10 (134.2) [3] !Fall 2012!					11:40 (134.6) [10] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.6		1.6		11.2					1.6	0		0.7		2.4					-3.9
16000 - 9111 - MAIN ST @ VINE ST	0.2		0.1		11.3					1.6	0		0		2.4					-3.9
16400 - 9113 - MAIN ST @ LAKE ST	0		0.4		10.9					1.6	0.3		1.3		1.4					-3.9
16800 - 9114 - 757 MAIN ST	0		0.5		10.4					1.6	0		0.3		1.1					-3.9
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.5		9.9					1.6	0		1.3		-0.2					-3.9
17600 - 9116 - 955 MAIN ST	0.2		0.3		9.8					1.6	0		0.3		-0.5					-3.9
18000 - 9117 - 995 MAIN ST	0		0.2		9.6					1.6	0		0.3		-0.8					-3.9
18400 - 9118 - MAIN ST @ CRANES CT	0		0.4		9.2					1.6	0		0.3		-1.1					-3.9
18800 - 9119 - MAIN ST @ VINING CT	0		0.3		8.9					1.6	0.7		0.3		-0.7					-3.9
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.2		8.7					1.6	0		0		-0.7					-3.9
19600 - 9121 - MAIN ST @ FOWLE ST	0.2		1.5		7.4					1.6	0		0		-0.7					-3.9
20000 - 9122 - MAIN ST @ GREEN ST	0.5		0.3		7.6					1.6	0.3		0.3		-0.7					-3.9
20400 - 9123 - 275 MAIN ST	0		0.1		7.5					1.6	0		0		-0.7					-3.9
20800 - 9124 - MAIN ST @ MONTVALE AVE	0		1.5		6					1.6	0		1.3		-2					-3.9
21200 - 9127 - MAIN ST @ EVERETT ST	0.4		2.6		3.8					1.6	1		1		-2					-3.9
21600 - 9128 - MAIN ST @ MANNING ST	0		0.2		3.6					1.6	0		0		-2					-3.9
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		1.5		2.1					1.6	0		0		-2					-3.9
22400 - 9130 - MAIN ST @ PAGE PL	0		0		2.1					1.6	0		1.3		-3.3					-3.9
22800 - 9131 - MAIN ST @ EATON AVE	0		0.5		1.6					1.6	0		0.3		-3.6					-3.9
23200 - 9133 - MAIN ST @ FISHER TERR	0		0		1.6					1.6	0		0		-3.6					-3.9
23600 - 10016 - TRADECENTER 128	0.7		1.1		1.2					1.6	0		1		-4.6					-3.9
24000 - 9134 - ELM ST @ MONUMENT	0		0.9		0.3					1.6	0		1.3		-5.9					-3.9
24400 - 9135 - 31 ELM ST	0		0.2		0.1					1.6	0		0.3		-6.2					-3.9
24800 - 9136 - 53 ELM ST	0		0		0.1					1.6	0		0		-6.2					-3.9
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0.3		-0.2					1.6	0		0.7		-6.9					-3.9
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI	0		0		-0.2					1.6	0		0		-6.9					-3.9
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0.3		-0.5					1.6	0		0		-6.9					-3.9
26400 - 9140 - 949 MAIN ST	0		0.2		-0.7					1.6	0		0		-6.9					-3.9
26800 - 9142 - 979 MAIN ST	0		0		-0.7					1.6	0		0		-6.9					-3.9
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		-0.7					1.6	0		0		-6.9					-3.9
27600 - 9144 - 1075 MAIN ST	0		0		-0.7					1.6	0		0		-6.9					-3.9
28000 - 8852 - MAIN ST @ N MAPLE ST	0		0.5	2	-3.2				2	-0.4	0		1	2	-9.9				2	-5.9
28040 - 45002 - MEDFORD SO @ CITY HALL PARKIN					-3.2					-0.4					-9.9					-5.9
Maximum					20.2					10.4					14.1					11
Total	27.3		30.3			10.9		11.6			18.2		28.7			14.1		20		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	12:10 (134.3) [5] !Fall 2012!					12:40 (134.12) [12] !Fall 2012!					13:10 (134.3) [2] !Fall 2012!					13:40 (134.6) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	10.9	2	0		12.9	9.8	2	0		11.8	17	2	0		19	14.8	2	0		16.8
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0.4		12.8	0.6		0.4		12	0		0		19	0.1		0.1		16.8
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.2		12.6	0.2		0.6		11.6	0		0.5		18.5	0.3		1.1		16
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.4		0.2		12.8	0.2		0.8		11	0.5		0.5		18.5	0.1		0.3		15.8
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					12.8					11					18.5					15.8
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					12.8					11					18.5					15.8
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					12.8					11					18.5					15.8
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					12.8					11					18.5					15.8
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					12.8					11					18.5					15.8
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	1.6		0		14.4	0.8		0.5		11.3	0.5		0.5		18.5	1		0.9		15.9
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0		14.4	0.2		0.3		11.2	0.5		0.5		18.5	0		0.5		15.4
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		14.4					11.2	0		0		18.5	0.1		0		15.5
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0.2		0.2		14.4					11.2	0		0.5		18	0		0		15.5
3600 - 49157 - 61 LOCUST ST	0.8		2.4		12.8					11.2	2		1.5		18.5	0.4		4.4		11.5
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					12.8	0		0.3		10.9					18.5					11.5
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.8		3		11.6	2.9		8.5		5.3	3		5		16.5	2.1		5.7		7.9
4400 - 9165 - 350 RIVERSIDE AVE	0.2		0.6		11.2	0.3		1.6		4	1		0		17.5	0.1		0.6		7.4
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.6		1.4		10.4	0.5		0.4		4.1	1		0.5		18	0.4		0.6		7.2
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0		10.4	0.1		0.3		3.9	0		0		18	0.2		0.3		7.1
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0.2		0		10.6	0		0.6		3.3	0		0		18	0.4		1.1		6.4
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.2		0.4		10.4	0.1		0.7		2.7	0		0.5		17.5	0.1		0.3		6.2
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0.2		10.2	0		0.1		2.6	0		0		17.5	0		0.1		6.1
6800 - 9172 - 116 RIVERSIDE AVE	0.2		2.2		8.2	0		1.2		1.4	0.5		1		17	0.1		1.2		5
7200 - 5002 - SALEM ST OPP RIVER ST	1.8		2.2		7.8	0.9		3.1		-0.8	3.5		4		16.5	0.2		2.2		3
7600 - 15002 - HIGH ST @ BRADLEE RD	0		0.6		7.2	0		0.3		-1.1	0.5		2		15	0.1		0.6		2.5
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0.4		6.8	0		0.4		-1.5	0		1.5		13.5	0.4		0.9		2
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0.2		0.8		6.2	0.1		0.3		-1.7	0		0.5		13	0		0.9		1.1
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.8		0.8		6.2	0		0.2		-1.9	0		0.5		12.5	0		0.7		0.4
9200 - 5006 - 305 WINTHROP ST	0		0		6.2	0		0		-1.9	0		1		11.5	0.1		0.1		0.4
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		6.2	0		0.1		-2	0		0.5		11	0		0.4		1.1E-16
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		6.2	0.1		0		-1.9	0		0		11	0		0		1.1E-16
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0.2		0.4		6	0		0.1		-2	0		0.5		10.5	0		0.6		-0.6
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.2		5.8	0		0.4		-2.4	0		1		9.5	0		0.5		-1.1
11200 - 9178 - WINTHROP ST OPP SMITH LN	0.2		0		6	0		0.3		-2.7	0		0		9.5	0		0.3		-1.4
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0.2		0		6.2	0		3.6		-6.3	0		1.5		8	0		1.5		-2.9
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0.4		0.2		6.4					-6.3	0		0		8					-2.9
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		6.4					-6.3	0		0		8					-2.9
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		6.4					-6.3	0		0		8					-2.9
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		6.4					-6.3	0		0		8					-2.9
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		6.4					-6.3	0		0		8					-2.9
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0.2		6.2					-6.3	0		0		8					-2.9
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0.2		6					-6.3	0		0		8					-2.9
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		6					-6.3	0		0.5		7.5					-2.9
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		6					-6.3	0		0		7.5					-2.9

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	12:10 (134.3) [5] !Fall 2012!					12:40 (134.12) [12] !Fall 2012!					13:10 (134.3) [2] !Fall 2012!					13:40 (134.6) [14] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.2		0.8		5.4					-6.3	0.5		1		7					-2.9
16000 - 9111 - MAIN ST @ VINE ST	0		0.2		5.2					-6.3	0		0.5		6.5					-2.9
16400 - 9113 - MAIN ST @ LAKE ST	0.2		0.2		5.2					-6.3	1		1.5		6					-2.9
16800 - 9114 - 757 MAIN ST	0		0.2		5					-6.3	0		0		6					-2.9
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.4		4.6					-6.3	0		2.5		3.5					-2.9
17600 - 9116 - 955 MAIN ST	0.4		0.2		4.8					-6.3	0		0.5		3					-2.9
18000 - 9117 - 995 MAIN ST	0		0		4.8					-6.3	0		1.5		1.5					-2.9
18400 - 9118 - MAIN ST @ CRANES CT	0.2		0.4		4.6					-6.3	0		0.5		1					-2.9
18800 - 9119 - MAIN ST @ VINING CT	0		1		3.6					-6.3	0		0		1					-2.9
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.2		3.4					-6.3	0		1		0					-2.9
19600 - 9121 - MAIN ST @ FOWLE ST	0		0.6		2.8					-6.3	0.5		1		-0.5					-2.9
20000 - 9122 - MAIN ST @ GREEN ST	0		0		2.8					-6.3	0		0		-0.5					-2.9
20400 - 9123 - 275 MAIN ST	0.2		1.2		1.8					-6.3	0.5		0		0					-2.9
20800 - 9124 - MAIN ST @ MONTVALE AVE	0		2.2		-0.4					-6.3	1		4		-3					-2.9
21200 - 9127 - MAIN ST @ EVERETT ST	0.8		1		-0.6					-6.3	0		1		-4					-2.9
21600 - 9128 - MAIN ST @ MANNING ST	0		0.4		-1					-6.3	0		1		-5					-2.9
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0.2		-1.2					-6.3	0		1.5		-6.5					-2.9
22400 - 9130 - MAIN ST @ PAGE PL	0		0		-1.2					-6.3	0		1		-7.5					-2.9
22800 - 9131 - MAIN ST @ EATON AVE	0.2		1.4		-2.4					-6.3	0		1.5		-9					-2.9
23200 - 9133 - MAIN ST @ FISHER TERR	0		0.4		-2.8					-6.3	0		0		-9					-2.9
23600 - 10016 - TRADECENTER 128	0		0		-2.8					-6.3	0		2		-11					-2.9
24000 - 9134 - ELM ST @ MONUMENT	0		2.2		-5					-6.3	0.5		1.5		-12					-2.9
24400 - 9135 - 31 ELM ST	0		0		-5					-6.3	0		0		-12					-2.9
24800 - 9136 - 53 ELM ST	0		0.2		-5.2					-6.3	0		0		-12					-2.9
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0.2		0.2		-5.2					-6.3	0		1		-13					-2.9
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					-5.2					-6.3					-13					-2.9
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		1		-6.2					-6.3	0		1.5		-14.5					-2.9
26400 - 9140 - 949 MAIN ST	0		0.2		-6.4					-6.3	0		0		-14.5					-2.9
26800 - 9142 - 979 MAIN ST	0		0.2		-6.6					-6.3	0		0		-14.5					-2.9
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0.4		-7					-6.3	0		0		-14.5					-2.9
27600 - 9144 - 1075 MAIN ST	0		0		-7					-6.3	0		0		-14.5					-2.9
28000 - 8852 - MAIN ST @ N MAPLE ST	0		0.6	2	-9.6				2	-8.3	0		1.5	2	-18				2	-4.9
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					-9.6					-8.3					-18					-4.9
Maximum					14.4					12					19					16.8
Total	23.6		33.2			16.5		24.9			34		52			21		25.6		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																			
	14:10 (134.3) [4] !Fall 2012!					14:40 (134.12) [14] !Fall 2012!					15:10 (134.5) [6] !Fall 2012!					15:30 (134.6) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	20.6	2	0		22.6	14.7	2	0		16.7	21.8	1	0		22.8	15.3	1	0		16.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.4		0.2		22.8	0.1		0		16.8	0		0		22.8	0		0		16.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.5		22.3	0.1		0.6		16.3	1		0.3		23.5	1		0.4		16.9
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.5		0.5		22.3	0.1		0.8		15.6	0.2		0		23.7	0.3		0.3		16.9
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					22.3					15.6					23.7					16.9
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					22.3					15.6					23.7					16.9
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					22.3					15.6					23.7					16.9
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					22.3					15.6					23.7					16.9
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					22.3					15.6					23.7					16.9
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.3		0.8		21.8	0.4		0.6		15.4	0.7		0.2		24.2	1.4		0.4		17.9
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.3		1		21.1	0.2		0.3		15.3	0		0		24.2	0.1		0.3		17.7
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		21.1					15.3	0		0		24.2	0		0		17.7
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0		21.1					15.3	0.5		0.2		24.5	0		0.1		17.6
3600 - 49157 - 61 LOCUST ST	0.5		2		19.6					15.3	1.3		4.5		21.3	0		4.6		13
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					19.6	0		0		15.3					21.3					13
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.5		4.8		16.3	2.4		9.7		8	3		3.5		20.8	1.4		5.6		8.8
4400 - 9165 - 350 RIVERSIDE AVE	0		1		15.3	0		0.5		7.5	0.3		0.7		20.4	0.3		0.5		8.6
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.5		0.8		15	0.3		0.5		7.3	1.3		0.5		21.2	0		0.3		8.3
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0.8		14.2	0		0.6		6.7	0		0.3		20.9	0		0		8.3
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0.3		0.3		14.2	0.4		0.6		6.5	0.2		0		21.1	0.5		1.1		7.7
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0.3		13.9	0		0.1		6.4	0.2		0		21.3	0.3		0.5		7.5
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		13.9	0		0.1		6.3	0		0		21.3	0		0		7.5
6800 - 9172 - 116 RIVERSIDE AVE	0		0.8		13.1	0.2		0.9		5.6	0		1		20.3	0		0.5		7
7200 - 5002 - SALEM ST OPP RIVER ST	1.8		1.8		13.1	0.4		1.6		4.4	1.2		2.7		18.8	0.3		2.1		5.2
7600 - 15002 - HIGH ST @ BRADLEE RD	0.3		0		13.4	0.3		1.1		3.6	0		0.3		18.5	0		0.8		4.4
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0.5		0.3		13.6	0.1		0.4		3.3	0.2		0.5		18.2	0.5		0		4.9
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0		13.6	0		0.3		3	0.2		1		17.4	0		0.4		4.5
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		0.3		13.3	0		0.2		2.8	0		0.5		16.9	0		0.4		4.1
9200 - 5006 - 305 WINTHROP ST	0		0		13.3	0		0		2.8	0.2		0		17.1	0		0.1		4
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		13.3	0		0.2		2.6	0		0.3		16.8	0		0.1		3.9
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		13.3	0		0		2.6	0		0		16.8	0		0		3.9
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0.3		13	0		0.2		2.4	0		0		16.8	0		0.1		3.8
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0.8		1.3		12.5	0		0.7		1.7	0.8		1.7		15.9	0		0.9		2.9
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		12.5	0		0.4		1.3	0		0.2		15.7	0.4		0.9		2.4
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0.8		0		13.3	0		3.4		-2.1	0.2		0		15.9	0		2.3		0.1
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		13.3					-2.1	0		0.2		15.7					0.1
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		13.3					-2.1	0.2		0		15.9					0.1
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		13.3					-2.1	0		0		15.9					0.1
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		13.3					-2.1	0		0		15.9					0.1
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		13.3					-2.1	0		0		15.9					0.1
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		13.3					-2.1	0		0		15.9					0.1
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		13.3					-2.1	0		0.2		15.7					0.1
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0.3		13					-2.1	0		0		15.7					0.1
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		13					-2.1	0		0		15.7					0.1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																			
	14:10 (134.3) [4] !Fall 2012!					14:40 (134.12) [14] !Fall 2012!					15:10 (134.5) [6] !Fall 2012!					15:30 (134.6) [8] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0		1.3		11.7					-2.1	1.3		1.5		15.5					0.1
16000 - 9111 - MAIN ST @ VINE ST	0		0		11.7					-2.1	0		0.2		15.3					0.1
16400 - 9113 - MAIN ST @ LAKE ST	0.5		1.5		10.7					-2.1	0.8		1.7		14.4					0.1
16800 - 9114 - 757 MAIN ST	0		0.3		10.4					-2.1	0.3		0.8		13.9					0.1
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.8		9.6					-2.1	0		0.2		13.7					0.1
17600 - 9116 - 955 MAIN ST	0		0.3		9.3					-2.1	0.3		0.7		13.3					0.1
18000 - 9117 - 995 MAIN ST	0		0		9.3					-2.1	0		0.7		12.6					0.1
18400 - 9118 - MAIN ST @ CRANES CT	0.3		1		8.6					-2.1	0.5		0.5		12.6					0.1
18800 - 9119 - MAIN ST @ VINING CT	0		0		8.6					-2.1	0		0		12.6					0.1
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.3		8.3					-2.1	0		0.7		11.9					0.1
19600 - 9121 - MAIN ST @ FOWLE ST	0		1.8		6.5					-2.1	0.3		1.3		10.9					0.1
20000 - 9122 - MAIN ST @ GREEN ST	0		0.8		5.7					-2.1	0.2		0.8		10.3					0.1
20400 - 9123 - 275 MAIN ST	1		0.5		6.2					-2.1	0		1		9.3					0.1
20800 - 9124 - MAIN ST @ MONTVALE AVE	0.3		3.8		2.7					-2.1	0.2		2.5		7					0.1
21200 - 9127 - MAIN ST @ EVERETT ST	1.3		0.8		3.2					-2.1	0.2		3.8		3.4					0.1
21600 - 9128 - MAIN ST @ MANNING ST	0		0		3.2					-2.1	0		0.5		2.9					0.1
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0.3		2.9					-2.1	0		0		2.9					0.1
22400 - 9130 - MAIN ST @ PAGE PL	0		0.3		2.6					-2.1	0		0.8		2.1					0.1
22800 - 9131 - MAIN ST @ EATON AVE	0		0		2.6					-2.1	0		0		2.1					0.1
23200 - 9133 - MAIN ST @ FISHER TERR	0.3		1.5		1.4					-2.1	0		0.3		1.8					0.1
23600 - 10016 - TRADECENTER 128	0		0		1.4					-2.1					1.8					0.1
24000 - 9134 - ELM ST @ MONUMENT	1		3.3		-0.9					-2.1	0		6		-4.2					0.1
24400 - 9135 - 31 ELM ST	0		0		-0.9					-2.1	0		0		-4.2					0.1
24800 - 9136 - 53 ELM ST	0		0.3		-1.2					-2.1	0		0		-4.2					0.1
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0		-1.2					-2.1	0		1.5		-5.7					0.1
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					-1.2					-2.1					-5.7					0.1
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		1		-2.2					-2.1	0		1.8		-7.5					0.1
26400 - 9140 - 949 MAIN ST	0		0.8		-3					-2.1	0		0.7		-8.2					0.1
26800 - 9142 - 979 MAIN ST	0		0.5		-3.5					-2.1	0		0		-8.2					0.1
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		-3.5					-2.1	0		0		-8.2					0.1
27600 - 9144 - 1075 MAIN ST	0		0		-3.5					-2.1	0		0		-8.2					0.1
28000 - 8852 - MAIN ST @ N MAPLE ST	0		0.5	2	-6				2	-4.1	0		1.5	1	-10.7				1	-0.9
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					-6					-4.1					-10.7					-0.9
Maximum					22.8					16.8					24.5					17.9
Total	33.3		38.5			19.6		23.9			37.4		48.2			21.5		22.5		

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

	15:50 (134.6) [11] !Fall 2012!					16:10 (134.5) [13] !Fall 2012!					16:30 (134.6) [8] !Fall 2012!					16:50 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	9.8	1	0		10.8	39.3	2	0		41.3	13.5	1	0		14.5	13.2	2	0		15.2
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.6		0.4		11	0.2		0.1		41.4	0		0		14.5	0		0.2		15
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.2		0.7		10.5	0.5		0.7		41.2	0.3		1.1		13.7	1		0.5		15.5
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.2		0.2		10.5	0.4		0.5		41.1	0		0.4		13.3	0		0		15.5
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					10.5					41.1					13.3					15.5
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					10.5					41.1					13.3					15.5
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					10.5					41.1					13.3					15.5
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					10.5					41.1					13.3					15.5
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					10.5					41.1					13.3					15.5
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.2		0.9		9.8	1.2		2.3		40	0		0.8		12.5	0.8		0.2		16.1
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.1		0.2		9.7	0.1		0.2		39.9	0		1		11.5	0		0		16.1
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0.1		0.1		9.7	0.1		0		40	0		0		11.5	0		0		16.1
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0.5		9.2	0.3		0.2		40.1	0.1		0.6		11	0		0.2		15.9
3600 - 49157 - 61 LOCUST ST	0.2		3.5		5.9	0.5		5.2		35.4	0		4.4		6.6	0.2		4.5		11.6
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					5.9					35.4					6.6					11.6
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.4		2.6		4.7	5.5		5.1		35.8	0.6		4.1		3.1	1.5		4.2		8.9
4400 - 9165 - 350 RIVERSIDE AVE	0		1.4		3.3	0.1		1.3		34.6	0		0.4		2.7	0.5		0.8		8.6
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		0.5		2.8	0.2		0.7		34.1	0		0.6		2.1	0.3		0.3		8.6
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0.2		2.6	0.1		0.2		34	0		0.9		1.2	0		0		8.6
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0.2		0.5		2.3	0.2		0.9		33.3	0		0.5		0.7	0		0.5		8.1
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.3		0.5		2.1	0.2		0.4		33.1	0		1.8		-1.1	0		0.3		7.8
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		2.1	0		0.1		33	0		0		-1.1	0.2		0		8
6800 - 9172 - 116 RIVERSIDE AVE	0		0.6		1.5	0.2		0.8		32.4	0		0.3		-1.4	0		1.3		6.7
7200 - 5002 - SALEM ST OPP RIVER ST	0.5		2		-8.9E-16	1.8		2.6		31.6	0		1.1		-2.5	0.2		1.8		5.1
7600 - 15002 - HIGH ST @ BRADLEE RD	0		0.7		-0.7	0.6		0.8		31.4	0.1		1		-3.4	0.2		0.3		5
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0.1		0.2		-0.8	0.3		0.1		31.6	0		0		-3.4	0.2		0.8		4.4
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0		-0.8	0		0.2		31.4	0		0.3		-3.7	0.2		0.2		4.4
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.1		0.7		-1.4	0.3		0.2		31.5	0		0.1		-3.8	0		0.7		3.7
9200 - 5006 - 305 WINTHROP ST	0		0		-1.4	0		0.2		31.3	0		0		-3.8	0		0.5		3.2
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0.4		-1.8	0		0.2		31.1	0		0		-3.8	0		0.3		2.9
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0.2		-2	0.1		0		31.2	0		0.3		-4.1	0		0		2.9
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0.2		-2.2	0		0.3		30.9	0		0.1		-4.2	0		0		2.9
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.5		-2.7	0		0.8		30.1	0		0		-4.2	0		0.3		2.6
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0.1		-2.8	0		0.2		29.9	0		0		-4.2	0		0		2.6
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		1		-3.8	0.3		0		30.2	0		2.5		-6.7	0		0.3		2.3
12000 - 9101 - WINTHROP ST @ WINFORD WAY					-3.8	0		0.2		30					-6.7					2.3
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON					-3.8	0		0		30					-6.7					2.3
12800 - 9103 - MAIN ST @ TOWN WAY					-3.8	0.2		0		30.2					-6.7					2.3
13200 - 9104 - MAIN ST @ HIGHLAND AVE					-3.8	0		0.2		30					-6.7					2.3
13600 - 9105 - MAIN ST @ EVERELL RD					-3.8	0		0.2		29.8					-6.7					2.3
14000 - 9106 - MAIN ST @ MARSHALL RD					-3.8	0		0		29.8					-6.7					2.3
14400 - 9107 - MAIN ST @ CHESTNUT ST					-3.8	0		0.1		29.7					-6.7					2.3
14800 - 9108 - MAIN ST @ PROSPECT ST					-3.8	0.1		0.2		29.6					-6.7					2.3
15200 - 9109 - MAIN ST @ FAIRVIEW TERR					-3.8	0		0		29.6					-6.7					2.3

Massachusetts Bay Transportation Authority
Route 134
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	15:50 (134.6) [11] !Fall 2012!					16:10 (134.5) [13] !Fall 2012!					16:30 (134.6) [8] !Fall 2012!					16:50 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR					-3.8	1.6		1.2		30					-6.7					2.3
16000 - 9111 - MAIN ST @ VINE ST					-3.8	0		0.1		29.9					-6.7					2.3
16400 - 9113 - MAIN ST @ LAKE ST					-3.8	0.1		0.9		29.1					-6.7					2.3
16800 - 9114 - 757 MAIN ST					-3.8	0.2		0.2		29.1					-6.7					2.3
17200 - 9115 - MAIN ST OPP RICHARDSON ST					-3.8	0.4		1.2		28.3					-6.7					2.3
17600 - 9116 - 955 MAIN ST					-3.8	0.1		1.3		27.1					-6.7					2.3
18000 - 9117 - 995 MAIN ST					-3.8	0		0.2		26.9					-6.7					2.3
18400 - 9118 - MAIN ST @ CRANES CT					-3.8	0		0.5		26.4					-6.7					2.3
18800 - 9119 - MAIN ST @ VINING CT					-3.8	0		0.5		25.9					-6.7					2.3
19200 - 9120 - MAIN ST @ RICHARDSON ST					-3.8	0.2		0.9		25.2					-6.7					2.3
19600 - 9121 - MAIN ST @ FOWLE ST					-3.8	0.1		0.8		24.5					-6.7					2.3
20000 - 9122 - MAIN ST @ GREEN ST					-3.8	0		1.5		23					-6.7					2.3
20400 - 9123 - 275 MAIN ST					-3.8	0		1.2		21.8					-6.7					2.3
20800 - 9124 - MAIN ST @ MONTVALE AVE					-3.8	0.2		3.8		18.2					-6.7					2.3
21200 - 9127 - MAIN ST @ EVERETT ST					-3.8	1.5		3.8		15.9					-6.7					2.3
21600 - 9128 - MAIN ST @ MANNING ST					-3.8	0		0.5		15.4					-6.7					2.3
22000 - 9129 - MAIN ST @ MISHAWUM RD					-3.8	0		0.3		15.1					-6.7					2.3
22400 - 9130 - MAIN ST @ PAGE PL					-3.8	0		0.2		14.9					-6.7					2.3
22800 - 9131 - MAIN ST @ EATON AVE					-3.8	0.1		1.2		13.8					-6.7					2.3
23200 - 9133 - MAIN ST @ FISHER TERR					-3.8	0		0.2		13.6					-6.7					2.3
23600 - 10016 - TRADECENTER 128					-3.8					13.6					-6.7					2.3
24000 - 9134 - ELM ST @ MONUMENT					-3.8	0.2		5.2		8.6					-6.7					2.3
24400 - 9135 - 31 ELM ST					-3.8	0.2		0.6		8.2					-6.7					2.3
24800 - 9136 - 53 ELM ST					-3.8	0		1.5		6.7					-6.7					2.3
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST					-3.8	0		1.2		5.5					-6.7					2.3
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					-3.8					5.5					-6.7					2.3
26000 - 9139 - MAIN ST @ NICHOLS ST E					-3.8	0.1		2		3.6					-6.7					2.3
26400 - 9140 - 949 MAIN ST					-3.8	0		0.4		3.2					-6.7					2.3
26800 - 9142 - 979 MAIN ST					-3.8	0		0.6		2.6					-6.7					2.3
27200 - 9143 - MAIN ST @ WHEELING AVE					-3.8	0.1		0.2		2.5					-6.7					2.3
27600 - 9144 - 1075 MAIN ST					-3.8	0		0		2.5					-6.7					2.3
28000 - 8852 - MAIN ST @ N MAPLE ST				1	-4.8	0		0.2	2	0.3				1	-7.7				2	0.3
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					-4.8					0.3					-7.7					0.3
Maximum					11					41.4					14.5					16.1
Total	13.7		19			57.5		57.3			14.6		22.1			18.3		18.3		

Massachusetts Bay Transportation Authority
Route 134
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	17:10 (134.5) [8] !Fall 2012!					17:40 (134.6) [3] !Fall 2012!					18:10 (134.5) [11] !Fall 2012!					18:35 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	24.7	0	0		24.7	34	0	0		34	25.5	1	0		26.5	18.3	0	0		18.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.2		0		24.9	0.7		0		34.7	0.2		0.1		26.6	0		0		18.3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	1.3		0.4		25.8	0		0.3		34.4	0.7		0.1		27.2	0.2		0.5		18
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		25.8	0.3		0		34.7	0.3		0.2		27.3	0.2		0.2		18
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					25.8					34.7					27.3					18
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					25.8					34.7					27.3					18
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					25.8					34.7					27.3					18
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					25.8					34.7					27.3					18
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					25.8					34.7					27.3					18
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.5		0.5		25.8	0		2.7		32	0.7		0.5		27.5	1		1		18
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0.5		25.3	0		0		32	0		0.3		27.2	0.2		0.2		18
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		25.3	0		0		32	0		0.2		27	0		0		18
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0.6		24.7	0		0		32	0		1.1		25.9	0.2		1		17.2
3600 - 49157 - 61 LOCUST ST	1.1		3.9		21.9	2		13.7		20.3	1.3		6.3		20.9	0.7		6.5		11.4
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					21.9					20.3					20.9					11.4
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	3.5		3.6		21.8	2		5		17.3	3.7		5.5		19.1	0.7		2.3		9.8
4400 - 9165 - 350 RIVERSIDE AVE	0.3		0.3		21.8	0		0.7		16.6	0.4		1.5		18	0		0.7		9.1
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.4		0.4		21.8	0		0.7		15.9	0.3		0.8		17.5	0		0.8		8.3
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0.1		2.1		19.8	0		3		12.9	0.5		0.6		17.4	0		0.7		7.6
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		1.4		18.4	0.3		3.7		9.5	0.1		1.4		16.1	0		1		6.6
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0.1		18.3	0		1.7		7.8	0.3		0.9		15.5	0		0.7		5.9
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		18.3	0		0.7		7.1	0		0.3		15.2	0		0.7		5.2
6800 - 9172 - 116 RIVERSIDE AVE	0.1		0.5		17.9	0		0		7.1	0		0.5		14.7	0		1.2		4
7200 - 5002 - SALEM ST OPP RIVER ST	2.1		1.3		18.7	1.7		4		4.8	0.7		1.4		14	0.2		0.7		3.5
7600 - 15002 - HIGH ST @ BRADLEE RD	0.9		1.1		18.5	0.3		0.7		4.4	0.8		0.6		14.2	0		0.5		3
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0.1		0.1		18.5	0		0.3		4.1	0.3		0.3		14.2	0		0.5		2.5
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0.1		0		18.6	0		0		4.1	0.1		0.2		14.1	0		0		2.5
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.1		0.3		18.4	0		0		4.1	0.5		0.2		14.4	0		0.2		2.3
9200 - 5006 - 305 WINTHROP ST	0		0.1		18.3	0.7		3		1.8	0		0		14.4	0		0		2.3
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0.4		17.9	0		0		1.8	0		0		14.4	0		0		2.3
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		17.9	0		0		1.8	0		0		14.4	0		0		2.3
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0.5		17.4	0		0		1.8	0		0.4		14	0		0.2		2.1
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.9		16.5	0		0.7		1.1	0.5		1.9		12.6	0		0.3		1.8
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		16.5	0		0		1.1	0		0		12.6	0		0		1.8
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0.1		0		16.6	0		1.3		-0.2	0.1		0		12.7	0		1.8		-4E-15
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0.1		16.5					-0.2	0.1		0.2		12.6					-4E-15
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		16.5					-0.2	0		0		12.6					-4E-15
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		16.5					-0.2	0		0.1		12.5					-4E-15
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		16.5					-0.2	0		0.1		12.4					-4E-15
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		16.5					-0.2	0		0		12.4					-4E-15
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		16.5					-0.2	0		0		12.4					-4E-15
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		16.5					-0.2	0.2		0		12.6					-4E-15
14800 - 9108 - MAIN ST @ PROSPECT ST	0.1		0.1		16.5					-0.2	0		0.2		12.4					-4E-15
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0.1		16.4					-0.2	0		0		12.4					-4E-15

Massachusetts Bay Transportation Authority
Route 134
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	17:10 (134.5) [8] !Fall 2012!					17:40 (134.6) [3] !Fall 2012!					18:10 (134.5) [11] !Fall 2012!					18:35 (134.6) [6] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	1.9		2.1		16.2					-0.2	0.8		1.2		12					-4E-15
16000 - 9111 - MAIN ST @ VINE ST	0		0		16.2					-0.2	0		0		12					-4E-15
16400 - 9113 - MAIN ST @ LAKE ST	0.4		0.3		16.3					-0.2	0.5		0.2		12.3					-4E-15
16800 - 9114 - 757 MAIN ST	0		0		16.3					-0.2	0		0.5		11.8					-4E-15
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0.1		1.3		15.1					-0.2	0		1.7		10.1					-4E-15
17600 - 9116 - 955 MAIN ST	0.3		0.6		14.8					-0.2	0		0.2		9.9					-4E-15
18000 - 9117 - 995 MAIN ST	0		0.5		14.3					-0.2	0		0.4		9.5					-4E-15
18400 - 9118 - MAIN ST @ CRANES CT	0.3		1.1		13.5					-0.2	0.1		2		7.6					-4E-15
18800 - 9119 - MAIN ST @ VINING CT	0		1.5		12					-0.2	0		0.5		7.1					-4E-15
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.3		11.7					-0.2	0		0.9		6.2					-4E-15
19600 - 9121 - MAIN ST @ FOWLE ST	0.1		1.8		10					-0.2	0.2		0.3		6.1					-4E-15
20000 - 9122 - MAIN ST @ GREEN ST	0.3		1.3		9					-0.2	0.1		1.1		5.1					-4E-15
20400 - 9123 - 275 MAIN ST	0.1		0.5		8.6					-0.2	0		0.7		4.4					-4E-15
20800 - 9124 - MAIN ST @ MONTVALE AVE	0.4		4.4		4.6					-0.2	0.3		2.5		2.2					-4E-15
21200 - 9127 - MAIN ST @ EVERETT ST	0		2		2.6					-0.2	1.4		3.3		0.3					-4E-15
21600 - 9128 - MAIN ST @ MANNING ST	0		1.6		1					-0.2	0		1.5		-1.2					-4E-15
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0		1					-0.2	0		0		-1.2					-4E-15
22400 - 9130 - MAIN ST @ PAGE PL	0		0.1		0.9					-0.2	0.2		0.1		-1.1					-4E-15
22800 - 9131 - MAIN ST @ EATON AVE	0.1		0.8		0.2					-0.2	0		0.3		-1.4					-4E-15
23200 - 9133 - MAIN ST @ FISHER TERR	0		0.1		0.1					-0.2	0		0.4		-1.8					-4E-15
23600 - 10016 - TRADECENTER 128	.				#VALUE!					-0.2					-1.8					-4E-15
24000 - 9134 - ELM ST @ MONUMENT	0.3		5.9		#VALUE!					-0.2	0.3		5.7		-7.2					-4E-15
24400 - 9135 - 31 ELM ST	0		1		#VALUE!					-0.2	0		0		-7.2					-4E-15
24800 - 9136 - 53 ELM ST	0		0.6		#VALUE!					-0.2	0		1.4		-8.6					-4E-15
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		1.6		#VALUE!					-0.2	0		0.8		-9.4					-4E-15
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI	.				#VALUE!					-0.2					-9.4					-4E-15
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		1.6		#VALUE!					-0.2	0		1.1		-10.5					-4E-15
26400 - 9140 - 949 MAIN ST	0		0.8		#VALUE!					-0.2	0		0.5		-11					-4E-15
26800 - 9142 - 979 MAIN ST	0		0.1		#VALUE!					-0.2	0		0.8		-11.8					-4E-15
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		#VALUE!					-0.2	0		0		-11.8					-4E-15
27600 - 9144 - 1075 MAIN ST	0		0		#VALUE!					-0.2	0		0		-11.8					-4E-15
28000 - 8852 - MAIN ST @ N MAPLE ST	0		0.9	0	#VALUE!				0	-0.2	0		0.9	1	-13.7				0	-4E-15
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.				#VALUE!					-0.2					-13.7					-4E-15
Maximum					#VALUE!					34.7					27.5					18.3
Total	39.8		51.9			42		42			41.1		54.4			21.5		21.5		

Massachusetts Bay Transportation Authority
Route 134
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Seq - StopID - Stop Name	19:00 (134.5) [8] !Fall 2012!					19:40 (134.7) [4] !Fall 2012!					20:00 (134.7) [11] !Fall 2012!					21:00 (134.7) [12] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	36.9	2	0		38.9	14.8	2	0		16.8	9	2	0		11	8.7	2	0		10.7
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0.3		38.9	0		0		16.8	0		0.1		10.9	0.1		0.1		10.7
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		0.1		39.1	0.5		0.5		16.8	0.6		0.6		10.9	0.2		0.2		10.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0.1		0		39.2	0.3		0.3		16.8	0		0.1		10.8	0		0.2		10.5
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					39.2					16.8					10.8					10.5
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					39.2					16.8					10.8					10.5
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					39.2					16.8					10.8					10.5
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					39.2					16.8					10.8					10.5
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					39.2					16.8					10.8					10.5
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.6		0.5		39.3	0		1.5		15.3	0.2		0.7		10.3	0.3		1		9.8
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0.3		39	0		0.3		15	0		0		10.3	0.1		0		9.9
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		39	0		0		15	0		0.1		10.2	0		0.3		9.6
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0.5		2		37.5	0		0.5		14.5	0		0.1		10.1	0		0.8		8.8
3600 - 49157 - 61 LOCUST ST	0.8		8		30.3	0		5		9.5	0.1		3.9		6.3	0.6		5.4		4
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					30.3					9.5					6.3					4
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	2		1.3		31	0.3		1.3		8.5	0.8		0.9		6.2	1.6		1.7		3.9
4400 - 9165 - 350 RIVERSIDE AVE	0		2.6		28.4	0		1.3		7.2	0		0.5		5.7	0.3		2.6		1.6
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		1.4		27	0		0.3		6.9	0		1.2		4.5	0		1.7		-0.1
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		1.4		25.6	0		0.5		6.4	0		1.2		3.3	0		0		-0.1
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		2.1		23.5	0		0.3		6.1	0.1		1.9		1.5	0.2		0.8		-0.7
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0.9		22.6	0		1.8		4.3	0		1.7		-0.2	0		0.3		-1
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0.3		22.3	0		0.5		3.8	0		0.2		-0.4	0.2		0.3		-1.1
6800 - 9172 - 116 RIVERSIDE AVE	0		0.3		22	0		0.8		3	0		0.6		-1	0		2.1		-3.2
7200 - 5002 - SALEM ST OPP RIVER ST	1.3		1.5		21.8					3					-1					-3.2
7600 - 15002 - HIGH ST @ BRADLEE RD	0.5		0.4		21.9					3					-1					-3.2
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0		21.9					3					-1					-3.2
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0.1		0.3		21.7					3					-1					-3.2
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0.5		0.1		22.1					3					-1					-3.2
9200 - 5006 - 305 WINTHROP ST	0		0		22.1					3					-1					-3.2
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0.3		21.8					3					-1					-3.2
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		21.8					3					-1					-3.2
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0.1		21.7					3					-1					-3.2
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.3		21.4					3					-1					-3.2
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		21.4					3					-1					-3.2
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		21.4					3					-1					-3.2
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		21.4					3					-1					-3.2
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		21.4					3					-1					-3.2
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		21.4					3					-1					-3.2
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0.3		21.1					3					-1					-3.2
13600 - 9105 - MAIN ST @ EVERELL RD	0		0.3		20.8					3					-1					-3.2
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		20.8					3					-1					-3.2
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		20.8					3					-1					-3.2
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		20.8					3					-1					-3.2
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0.1		20.7					3					-1					-3.2

Massachusetts Bay Transportation Authority
Route 134
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	19:00 (134.5) [8] !Fall 2012!					19:40 (134.7) [4] !Fall 2012!					20:00 (134.7) [11] !Fall 2012!					21:00 (134.7) [12] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.3		0.8		20.2					3					-1					-3.2
16000 - 9111 - MAIN ST @ VINE ST	0		0.4		19.8					3					-1					-3.2
16400 - 9113 - MAIN ST @ LAKE ST	0.1		0.3		19.6					3					-1					-3.2
16800 - 9114 - 757 MAIN ST	0.4		0.1		19.9					3					-1					-3.2
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0.1		1.3		18.7					3					-1					-3.2
17600 - 9116 - 955 MAIN ST	0		0		18.7					3					-1					-3.2
18000 - 9117 - 995 MAIN ST	0		0.3		18.4					3					-1					-3.2
18400 - 9118 - MAIN ST @ CRANES CT	0		1.1		17.3					3					-1					-3.2
18800 - 9119 - MAIN ST @ VINING CT	0		0.8		16.5					3					-1					-3.2
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0.5		16					3					-1					-3.2
19600 - 9121 - MAIN ST @ FOWLE ST	0.1		0.4		15.7					3					-1					-3.2
20000 - 9122 - MAIN ST @ GREEN ST	0		0.8		14.9					3					-1					-3.2
20400 - 9123 - 275 MAIN ST	0		1.1		13.8					3					-1					-3.2
20800 - 9124 - MAIN ST @ MONTVALE AVE	0		1.8		12					3					-1					-3.2
21200 - 9127 - MAIN ST @ EVERETT ST	0		1.6		10.4					3					-1					-3.2
21600 - 9128 - MAIN ST @ MANNING ST	0		0.8		9.6					3					-1					-3.2
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		1		8.6					3					-1					-3.2
22400 - 9130 - MAIN ST @ PAGE PL	0		0		8.6					3					-1					-3.2
22800 - 9131 - MAIN ST @ EATON AVE	0		0.4		8.2					3					-1					-3.2
23200 - 9133 - MAIN ST @ FISHER TERR	0		0.3		7.9					3					-1					-3.2
23600 - 10016 - TRADECENTER 128					7.9					3					-1					-3.2
24000 - 9134 - ELM ST @ MONUMENT	0.5		3.5		4.9					3					-1					-3.2
24400 - 9135 - 31 ELM ST	0		0.3		4.6					3					-1					-3.2
24800 - 9136 - 53 ELM ST	0		0.5		4.1					3					-1					-3.2
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0.3		3.8					3					-1					-3.2
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					3.8					3					-1					-3.2
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0.5		3.3					3					-1					-3.2
26400 - 9140 - 949 MAIN ST	0		0.5		2.8					3					-1					-3.2
26800 - 9142 - 979 MAIN ST	0		0.3		2.5					3					-1					-3.2
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		2.5					3					-1					-3.2
27600 - 9144 - 1075 MAIN ST	0		0		2.5					3					-1					-3.2
28000 - 8852 - MAIN ST @ N MAPLE ST	0		1.4	2	-0.9				2	1				2	-3				2	-5.2
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					-0.9	0		1.3		-0.3	0		1.1		-4.1	0		0.6		-5.8
Maximum					39.3					16.8					11					10.7
Total	45.3		45.3			15.8		15.8			10.8		14.9			12.1		17.8		

Massachusetts Bay Transportation Authority
Route 134
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	22:00 (134.7) [12] !Fall 2012!					23:00 (134.7) [12] !Fall 2012!					24:00 (134.7) [12] !Fall 2012!					25:00 (134.7) [1] !Manual wi00!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	9.5	2	0		11.5	9.9	2	0		11.9	5.3	1	0		6.3	2	1			3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		11.5	0		0		11.9	0		0		6.3					3
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.2		0.1		11.6	0		0.1		11.8	0		0		6.3					3
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		11.6	0		0.2		11.6	0		0.1		6.2					3
1620 - 9038 - MIDDLESEX AVE @ FIRST ST					11.6					11.6					6.2					3
1640 - 9039 - MIDDLESEX AVE @ THIRD ST					11.6					11.6					6.2					3
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE					11.6					11.6					6.2					3
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE					11.6					11.6					6.2					3
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY					11.6					11.6					6.2					3
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.2		0.9		10.9	0		1		10.6	0		0.2		6					3
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.4		0.2		11.1	0.1		0.2		10.5	0		0.1		5.9					3
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0.1		11	0		0		10.5	0		0		5.9					3
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		1.4		9.6	0		0.3		10.2	0		0.4		5.5					3
3600 - 49157 - 61 LOCUST ST	0.3		3.5		6.4	0.2		3.4		7	0		1.6		3.9			1		2
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE					6.4					7					3.9					2
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1.4		0.8		7	0.8		0		7.8	0.6		0		4.5			1		1
4400 - 9165 - 350 RIVERSIDE AVE	0.1		0.6		6.5	0.1		2.2		5.7	0		0.7		3.8					1
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0.1		1.1		5.5	0		1.3		4.4	0		0.7		3.1					1
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0.3		5.2	0		1.3		3.1	0		0.6		2.5					1
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0.7		4.5	0		0.5		2.6	0		0.8		1.7					1
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0.7		3.8	0		1.5		1.1	0		0.5		1.2					1
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0.4		3.4	0		0		1.1	0		0.1		1.1					1
6800 - 9172 - 116 RIVERSIDE AVE	0		0.8		2.6	0		0.8		0.3	0		0.1		1					1
7200 - 5002 - SALEM ST OPP RIVER ST					2.6					0.3					1					1
7600 - 15002 - HIGH ST @ BRADLEE RD					2.6					0.3					1					1
8000 - 5003 - HIGH ST @ HILLSIDE AVE					2.6					0.3					1					1
8400 - 5004 - HIGH ST @ POWDER HOUSE RD					2.6					0.3					1					1
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO					2.6					0.3					1					1
9200 - 5006 - 305 WINTHROP ST					2.6					0.3					1					1
9600 - 9174 - WINTHROP ST @ LAWRENCE RD					2.6					0.3					1					1
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE					2.6					0.3					1					1
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL					2.6					0.3					1					1
10800 - 9177 - WINTHROP ST @ MEDFORD HS					2.6					0.3					1					1
11200 - 9178 - WINTHROP ST OPP SMITH LN					2.6					0.3					1					1
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD					2.6					0.3					1					1
12000 - 9101 - WINTHROP ST @ WINFORD WAY					2.6					0.3					1					1
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON					2.6					0.3					1					1
12800 - 9103 - MAIN ST @ TOWN WAY					2.6					0.3					1					1
13200 - 9104 - MAIN ST @ HIGHLAND AVE					2.6					0.3					1					1
13600 - 9105 - MAIN ST @ EVERELL RD					2.6					0.3					1					1
14000 - 9106 - MAIN ST @ MARSHALL RD					2.6					0.3					1					1
14400 - 9107 - MAIN ST @ CHESTNUT ST					2.6					0.3					1					1
14800 - 9108 - MAIN ST @ PROSPECT ST					2.6					0.3					1					1
15200 - 9109 - MAIN ST @ FAIRVIEW TERR					2.6					0.3					1					1

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	22:00 (134.7) [12] !Fall 2012!					23:00 (134.7) [12] !Fall 2012!					24:00 (134.7) [12] !Fall 2012!					25:00 (134.7) [1] !Manual wi00!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR					2.6					0.3					1					1
16000 - 9111 - MAIN ST @ VINE ST					2.6					0.3					1					1
16400 - 9113 - MAIN ST @ LAKE ST					2.6					0.3					1					1
16800 - 9114 - 757 MAIN ST					2.6					0.3					1					1
17200 - 9115 - MAIN ST OPP RICHARDSON ST					2.6					0.3					1					1
17600 - 9116 - 955 MAIN ST					2.6					0.3					1					1
18000 - 9117 - 995 MAIN ST					2.6					0.3					1					1
18400 - 9118 - MAIN ST @ CRANES CT					2.6					0.3					1					1
18800 - 9119 - MAIN ST @ VINING CT					2.6					0.3					1					1
19200 - 9120 - MAIN ST @ RICHARDSON ST					2.6					0.3					1					1
19600 - 9121 - MAIN ST @ FOWLE ST					2.6					0.3					1					1
20000 - 9122 - MAIN ST @ GREEN ST					2.6					0.3					1					1
20400 - 9123 - 275 MAIN ST					2.6					0.3					1					1
20800 - 9124 - MAIN ST @ MONTVALE AVE					2.6					0.3					1					1
21200 - 9127 - MAIN ST @ EVERETT ST					2.6					0.3					1					1
21600 - 9128 - MAIN ST @ MANNING ST					2.6					0.3					1					1
22000 - 9129 - MAIN ST @ MISHAWUM RD					2.6					0.3					1					1
22400 - 9130 - MAIN ST @ PAGE PL					2.6					0.3					1					1
22800 - 9131 - MAIN ST @ EATON AVE					2.6					0.3					1					1
23200 - 9133 - MAIN ST @ FISHER TERR					2.6					0.3					1					1
23600 - 10016 - TRADECENTER 128					2.6					0.3					1					1
24000 - 9134 - ELM ST @ MONUMENT					2.6					0.3					1					1
24400 - 9135 - 31 ELM ST					2.6					0.3					1					1
24800 - 9136 - 53 ELM ST					2.6					0.3					1					1
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST					2.6					0.3					1					1
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI					2.6					0.3					1					1
26000 - 9139 - MAIN ST @ NICHOLS ST E					2.6					0.3					1					1
26400 - 9140 - 949 MAIN ST					2.6					0.3					1					1
26800 - 9142 - 979 MAIN ST					2.6					0.3					1					1
27200 - 9143 - MAIN ST @ WHEELING AVE					2.6					0.3					1					1
27600 - 9144 - 1075 MAIN ST					2.6					0.3					1					1
28000 - 8852 - MAIN ST @ N MAPLE ST				2	0.6				2	-1.7				1	0				1	0
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0		1.3		-0.7	0		0.8		-2.5	0		0.3		-0.3	0		0		0
Maximum					11.6					11.9					6.3					3
Total	12		12.6			11		13.5			5.9		5.9			2		2		

Massachusetts Bay Transportation Authority

Route 134

Weekday - Outbound

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(Urban Transportation Associates)

	Total				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	587.1		0		638.1
800 - 9318 - CORPORATION WAY AFTER BRIDGE	10.4		2.4		646.1
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	13		17.1		642
1600 - 9045 - FELLSWAY @ BRADBURY AVE	4.9		9		637.9
1620 - 9038 - MIDDLESEX AVE @ FIRST ST	15.5		0		653.4
1640 - 9039 - MIDDLESEX AVE @ THIRD ST	2.4		0.3		655.5
1660 - 9040 - RIVERSIDE AVE @ MIDDLESEX AVE	8.7		0.1		664.1
1680 - 49040 - RIVERSIDE AVE @ BRADBURY AVE	11.4		0		675.5
1700 - 9041 - RIVERSIDE AVE @ FELLSWAY	1.6		0		677.1
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	23		23.1		677
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	10.4		13.4		674
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0.3		3.6		670.7
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	4		12.1		662.6
3600 - 49157 - 61 LOCUST ST	19.9		113.8		568.7
3620 - 49156 - COMMERCIAL ST. @ MYSTIC VALLE	0		2.1		566.6
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	58.3		125.4		499.5
4400 - 9165 - 350 RIVERSIDE AVE	24.1		29.2		494.4
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	32.4		21.6		505.2
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	4.8		16		494
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	15.4		22.8		486.6
6000 - 9170 - RIVERSIDE AVE @ PARK ST	18.3		17.8		487.1
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	1.2		4.8		483.5
6800 - 9172 - 116 RIVERSIDE AVE	1.9		27.7		457.7
7200 - 5002 - SALEM ST OPP RIVER ST	37.5		62.4		432.8
7600 - 15002 - HIGH ST @ BRADLEE RD	11.9		19.4		425.3
8000 - 5003 - HIGH ST @ HILLSIDE AVE	3.3		13.1		415.5
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	1.3		8.7		408.1
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	4.6		10.6		402.1
9200 - 5006 - 305 WINTHROP ST	1.7		7.4		396.4
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0.5		4.3		392.6
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0.2		1.2		391.6
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0.3		100.7		291.2
10800 - 9177 - WINTHROP ST @ MEDFORD HS	2.4		53.7		239.9
11200 - 9178 - WINTHROP ST OPP SMITH LN	0.6		3.5		237
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	3.6		24		216.6
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0.5		0.9		216.2
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0.2		0		216.4
12800 - 9103 - MAIN ST @ TOWN WAY	0.3		0.1		216.6
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0.1		0.9		215.8
13600 - 9105 - MAIN ST @ EVERELL RD	0		1.4		214.4
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0.4		214
14400 - 9107 - MAIN ST @ CHESTNUT ST	0.2		1		213.2
14800 - 9108 - MAIN ST @ PROSPECT ST	0.4		2.6		211
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0.2		210.8

Massachusetts Bay Transportation Authority
Route 134
Weekday - Outbound
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	Total				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	11.3		18.9		203.2
16000 - 9111 - MAIN ST @ VINE ST	1.1		1.7		202.6
16400 - 9113 - MAIN ST @ LAKE ST	4.7		10		197.3
16800 - 9114 - 757 MAIN ST	1.5		5.8		193
17200 - 9115 - MAIN ST OPP RICHARDSON ST	1.4		16.4		178
17600 - 9116 - 955 MAIN ST	1.3		6.8		172.5
18000 - 9117 - 995 MAIN ST	0		6		166.5
18400 - 9118 - MAIN ST @ CRANES CT	3.1		10.1		159.5
18800 - 9119 - MAIN ST @ VINING CT	0.9		7		153.4
19200 - 9120 - MAIN ST @ RICHARDSON ST	0.7		6		148.1
19600 - 9121 - MAIN ST @ FOWLE ST	1.5		10		139.6
20000 - 9122 - MAIN ST @ GREEN ST	4.6		12.1		132.1
20400 - 9123 - 275 MAIN ST	2.1		7.7		126.5
20800 - 9124 - MAIN ST @ MONTVALE AVE	5.2		38.4		93.3
21200 - 9127 - MAIN ST @ EVERETT ST	9		29.2		73.1
21600 - 9128 - MAIN ST @ MANNING ST	0.3		7		66.4
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		6.5		59.9
22400 - 9130 - MAIN ST @ PAGE PL	0.2		4.2		55.9
22800 - 9131 - MAIN ST @ EATON AVE	0.6		11.4		45.1
23200 - 9133 - MAIN ST @ FISHER TERR	0.3		10.6		34.8
23600 - 10016 - TRADECENTER 128	0.7		5.1		#VALUE!
24000 - 9134 - ELM ST @ MONUMENT	3.8		54.9		#VALUE!
24400 - 9135 - 31 ELM ST	1.9		4.2		#VALUE!
24800 - 9136 - 53 ELM ST	0		4.9		#VALUE!
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0.2		10.2		#VALUE!
25600 - 88591 - SCHOOL ST @ VET MEMORIAL SENI	0		0		#VALUE!
26000 - 9139 - MAIN ST @ NICHOLS ST E	0.1		14.8		#VALUE!
26400 - 9140 - 949 MAIN ST	0		4.4		#VALUE!
26800 - 9142 - 979 MAIN ST	0		4.2		#VALUE!
27200 - 9143 - MAIN ST @ WHEELING AVE	0.1		7.4		#VALUE!
27600 - 9144 - 1075 MAIN ST	0		0.2		#VALUE!
28000 - 8852 - MAIN ST @ N MAPLE ST	0		18.5		#VALUE!
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0		5.4		#VALUE!
Maximum	0		0		#VALUE!
Total	991.1		1133.1		0

Massachusetts Bay Transportation Authority

Route 134

Saturday - Inbound

Fall 2012

(Urban Transportation Associates)

Seq - StopID - Stop Name	06:15 (134.6) [1] !Fall 2012!					06:40 (134.6) [1] !Fall 2012!					07:05 (134.6) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1		2			2		0			0
800 - 8853 - 1076 MAIN ST					1					2					0
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1					2					0
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1					2					0
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1					2					0
2400 - 8857 - 940 MAIN ST					1					2					0
2800 - 8858 - MAIN ST @ NICHOLS ST					1					2					0
3600 - 8860 - ELM ST @ TRAVERSE ST					1					2					0
4000 - 8861 - ELM ST @ WARD ST					1					2					0
4400 - 8862 - ELM ST @ WEST ST					1					2					0
4800 - 8863 - ELM ST @ MONUMENT					1					2					0
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1					2					0
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1					2					0
6400 - 8866 - MAIN ST @ EATON AVE					1					2					0
6800 - 8867 - 646 MAIN ST					1					2					0
7200 - 8868 - MAIN ST @ CHARLES ST					1					2					0
7600 - 8869 - MAIN ST @ KILBY ST					1					2					0
8000 - 8870 - 466 MAIN ST OPP UNION ST					1					2					0
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1					2					0
8800 - 6941 - MAIN ST @ MYRTLE ST					1					2					0
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1					2					0
9600 - 6943 - MAIN ST @ WARREN AVE					1					2					0
10000 - 6944 - MAIN ST @ RICHARDSON ST					1					2					0
10400 - 6945 - 96 MAIN ST					1					2					0
10800 - 6946 - MAIN ST @ LYDON CT					1					2					0
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1					2					0
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1					2					0
12000 - 6949 - MAIN ST @ CANAL ST					1					2					0
12400 - 6950 - MAIN ST @ CLARK ST					1					2					0
12800 - 6951 - MAIN ST @ LAKE ST					1					2					0
13200 - 6952 - MAIN ST @ VINE ST					1					2					0
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1					2					0
14000 - 6953 - MAIN ST @ WASHINGTON ST					1					2					0
14400 - 6954 - MAIN ST @ MYSTIC AVE					1					2					0
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1					2					0
15200 - 6956 - MAIN ST @ W MADISON AVE					1					2					0
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1					2					0
16000 - 6958 - 104 MAIN ST					1					2					0
16400 - 6959 - MAIN ST @ GATEWAY S					1					2					0
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1					2					0

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	06:15 (134.6) [1] !Fall 2012!					06:40 (134.6) [1] !Fall 2012!					07:05 (134.6) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1					2					0
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		1	4		0		6	0		0		0
18000 - 9146 - 578 WINTHROP ST.	0		0		1	0		0		6	0		0		0
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		1	0		0		6	0		0		0
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		1	0		0		6	0		0		0
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		1	0		0		6	0		0		0
19600 - 5008 - 300 WINTHROP ST	0		0		1	0		0		6	1		0		1
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		1	0		0		6	0		0		1
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		1	0		0		6	0		0		1
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		1	0		0		6	0		0		1
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					1					6					1
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	0		0		1	0		0		6	1		0		2
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		1	0		0		6	0		0		2
22400 - 9152 - 163 RIVERSIDE AVE	0		0		1	0		0		6	0		0		2
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		1	0		0		6	0		0		2
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		1	0		0		6	0		0		2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		1	0		0		6	0		0		2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		1	0		0		6	0		0		2
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		1	0		0		6	1		0		3
26000 - 49157 - 61 LOCUST ST	3		0		4	1		0		7	2		0		5
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0		0		4	1		0		8	0		0		5
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		4	0		0		8	0		0		5
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		4	0		0		8	1		0		6
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		4	0		0		8	0		0		6
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		4	0		0		8	0		0		6
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		2		2	1		0		9	2		0		8
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		2	0		0		9	1		0		9
29200 - 5271 - WELLINGTON STATION BUSWAY	0		1	1	0	0		7	2	0	0		9	0	0
Maximum					4					9					9
Total	3		3			7		7			9		9		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	07:10 (134.5) [3] !Fall 2012!					08:05 (134.6) [1] !Fall 2012!					08:10 (134.5) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	2	1	0		3		0			0	0	1	0		1
800 - 8853 - 1076 MAIN ST	0		0		3					0	0		0		1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		3					0	0		0		1
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		3					0	3		0		4
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		3					0	0		0		4
2400 - 8857 - 940 MAIN ST	0		0		3					0	0		0		4
2800 - 8858 - MAIN ST @ NICHOLS ST	1.7		0		4.7					0	2		0		6
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		4.7					0	0		0		6
4000 - 8861 - ELM ST @ WARD ST	0		0		4.7					0	0		0		6
4400 - 8862 - ELM ST @ WEST ST	0		0		4.7					0	0		0		6
4800 - 8863 - ELM ST @ MONUMENT	1.7		0		6.4					0	5		0		11
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		6.4					0	0		0		11
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		6.4					0	0		0		11
6400 - 8866 - MAIN ST @ EATON AVE	0		0		6.4					0	0		0		11
6800 - 8867 - 646 MAIN ST	0.7		0		7.1					0	0		0		11
7200 - 8868 - MAIN ST @ CHARLES ST	0		0		7.1					0	0		0		11
7600 - 8869 - MAIN ST @ KILBY ST	1		0		8.1					0	1		0		12
8000 - 8870 - 466 MAIN ST OPP UNION ST	3.7		0		11.8					0	1		4		9
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	1.7		0		13.5					0	0		0		9
8800 - 6941 - MAIN ST @ MYRTLE ST	0		0		13.5					0	0		0		9
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0		0		13.5					0	0		0		9
9600 - 6943 - MAIN ST @ WARREN AVE	0.7		0		14.2					0	0		0		9
10000 - 6944 - MAIN ST @ RICHARDSON ST	1		0		15.2					0	0		0		9
10400 - 6945 - 96 MAIN ST	0.7		0		15.9					0	1		0		10
10800 - 6946 - MAIN ST @ LYDON CT	1		0		16.9					0	0		0		10
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0		0		16.9					0	0		0		10
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0		0.3		16.6					0	0		0		10
12000 - 6949 - MAIN ST @ CANAL ST	0.3		0		16.9					0	0		0		10
12400 - 6950 - MAIN ST @ CLARK ST	0		0		16.9					0	0		0		10
12800 - 6951 - MAIN ST @ LAKE ST	0.3		0		17.2					0	1		0		11
13200 - 6952 - MAIN ST @ VINE ST	0		0		17.2					0	0		0		11
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0.7		0.7		17.2					0	1		0		12
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		17.2					0	0		0		12
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		17.2					0	0		0		12
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		17.2					0	0		0		12
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		17.2					0	0		0		12
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		17.2					0	0		0		12
16000 - 6958 - 104 MAIN ST	0		0		17.2					0	0		0		12
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		17.2					0	0		0		12
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		17.2					0	0		0		12

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	07:10 (134.5) [3] !Fall 2012!					08:05 (134.6) [1] !Fall 2012!					08:10 (134.5) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		17.2					0	0		0		12
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		17.2	0		0		0	0		0		12
18000 - 9146 - 578 WINTHROP ST.	0		0		17.2	0		0		0	0		0		12
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		17.2	0		0		0	0		0		12
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		17.2	0		0		0	0		0		12
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		17.2	0		0		0	0		0		12
19600 - 5008 - 300 WINTHROP ST	0		0		17.2	0		0		0	0		0		12
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0.3		16.9	0		0		0	0		0		12
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		16.9	0		0		0	1		0		13
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		16.9	0		0		0	2		0		15
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					16.9					0					15
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	1.7		0		18.6	1		0		1	1		0		16
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	1		0		19.6	1		0		2	1		0		17
22400 - 9152 - 163 RIVERSIDE AVE	0		0		19.6	0		0		2	0		0		17
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.3		0		19.9	1		0		3	1		0		18
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		19.9	1		0		4	0		0		18
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		19.9	0		0		4	0		0		18
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		19.9	3		0		7	0		1		17
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		19.9	0		0		7	0		0		17
26000 - 49157 - 61 LOCUST ST	0		0		19.9	4		0		11	0		2		15
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.3		1.3		18.9	3		0		14	0		1		14
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0.3		0		19.2	0		0		14	2		0		16
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		19.2	0		0		14	0		0		16
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		19.2	0		0		14	0		0		16
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		19.2	0		0		14	0		0		16
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1.3		0.3		20.2	0		0		14	2		1		17
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		1.7		18.5	0		1		13	0		0		17
29200 - 5271 - WELLINGTON STATION BUSWAY	0		16.7	1	0.8	0		13	0	0	0		16	1	0
Maximum					20.2					14					18
Total	22		21.3			14		14			25		25		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	09:05 (134.6) [1] !Fall 2012!					09:10 (134.5) [2] !Fall 2012!					10:05 (134.6) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1	0.5	2	0		2.5		1			1
800 - 8853 - 1076 MAIN ST					1	0		0		2.5					1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1	0		0		2.5					1
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1	0		0		2.5					1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1	0.5		0		3					1
2400 - 8857 - 940 MAIN ST					1	0		0		3					1
2800 - 8858 - MAIN ST @ NICHOLS ST					1	0		0		3					1
3600 - 8860 - ELM ST @ TRAVERSE ST					1	0.5		0.5		3					1
4000 - 8861 - ELM ST @ WARD ST					1	0		0		3					1
4400 - 8862 - ELM ST @ WEST ST					1	0		0		3					1
4800 - 8863 - ELM ST @ MONUMENT					1	3		0		6					1
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1	0		0		6					1
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1	0		0		6					1
6400 - 8866 - MAIN ST @ EATON AVE					1	0		0		6					1
6800 - 8867 - 646 MAIN ST					1	0		0		6					1
7200 - 8868 - MAIN ST @ CHARLES ST					1	0		0		6					1
7600 - 8869 - MAIN ST @ KILBY ST					1	1.5		0		7.5					1
8000 - 8870 - 466 MAIN ST OPP UNION ST					1	1		0		8.5					1
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1	3.5		0		12					1
8800 - 6941 - MAIN ST @ MYRTLE ST					1	0		0		12					1
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1	0		0		12					1
9600 - 6943 - MAIN ST @ WARREN AVE					1	1		0		13					1
10000 - 6944 - MAIN ST @ RICHARDSON ST					1	0		0		13					1
10400 - 6945 - 96 MAIN ST					1	0		0		13					1
10800 - 6946 - MAIN ST @ LYDON CT					1	1		0		14					1
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1	0		0		14					1
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1	0.5		0		14.5					1
12000 - 6949 - MAIN ST @ CANAL ST					1	1.5		0		16					1
12400 - 6950 - MAIN ST @ CLARK ST					1	0		0		16					1
12800 - 6951 - MAIN ST @ LAKE ST					1	2.5		1		17.5					1
13200 - 6952 - MAIN ST @ VINE ST					1	0		0		17.5					1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1	1		0		18.5					1
14000 - 6953 - MAIN ST @ WASHINGTON ST					1	0		0		18.5					1
14400 - 6954 - MAIN ST @ MYSTIC AVE					1	0		0		18.5					1
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1	0		0		18.5					1
15200 - 6956 - MAIN ST @ W MADISON AVE					1	0		0		18.5					1
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1	0		0		18.5					1
16000 - 6958 - 104 MAIN ST					1	0		0		18.5					1
16400 - 6959 - MAIN ST @ GATEWAY S					1	0		0		18.5					1
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1	0		0		18.5					1

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	09:05 (134.6) [1] !Fall 2012!					09:10 (134.5) [2] !Fall 2012!					10:05 (134.6) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1	0		0		18.5					1
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		1	0		0		18.5	3		0		4
18000 - 9146 - 578 WINTHROP ST.	0		0		1	0		0		18.5	0		0		4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		1	0		0		18.5	0		0		4
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		1	0		0		18.5	0		0		4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		1	0		0		18.5	0		0		4
19600 - 5008 - 300 WINTHROP ST	0		0		1	0		0		18.5	0		0		4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		1	0.5		0		19	2		0		6
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		1	0.5		1		18.5	0		0		6
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		1	0		0		18.5	0		0		6
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					1					18.5					6
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	2		0		3	2.5		2.5		18.5	5		0		11
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		3	1		0		19.5	1		0		12
22400 - 9152 - 163 RIVERSIDE AVE	0		0		3	1		0		20.5	1		0		13
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		3	0.5		0		21	0		0		13
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		3	1		0		22	1		0		14
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		3	0		0.5		21.5	0		0		14
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		3	0.5		0		22	0		0		14
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		3	0.5		0		22.5	0		0		14
26000 - 49157 - 61 LOCUST ST	0		0		3	0.5		0.5		22.5	1		4		11
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	4		1		6	2.5		1.5		23.5	3		0		14
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		6	1.5		0		25	0		0		14
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		6	0		0		25	0		0		14
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		6	0		0		25	0		0		14
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		6	0		1.5		23.5	0		0		14
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	2		0		8	3		0.5		26	0		0		14
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		8	0		0.5		25.5	1		0		15
29200 - 5271 - WELLINGTON STATION BUSWAY	0		7	1	0	0		23.5	2	0	0		14	1	0
Maximum					8					26					15
Total	8		8			33.5		33.5			18		18		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	10:10 (134.5) [1] !Fall 2012!					11:05 (134.6) [2] !Fall 2012!					11:10 (134.5) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	2	2	0		4		2			2	0	1	0		1
800 - 8853 - 1076 MAIN ST	0		0		4					2	0		0		1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		4					2	0		0		1
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		4					2	0		0		1
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		4					2	0		0		1
2400 - 8857 - 940 MAIN ST	0		0		4					2	0		0		1
2800 - 8858 - MAIN ST @ NICHOLS ST	2		0		6					2	2		0		3
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		6					2	0.5		0		3.5
4000 - 8861 - ELM ST @ WARD ST	0		0		6					2	0.5		0		4
4400 - 8862 - ELM ST @ WEST ST	1		0		7					2	0		0		4
4800 - 8863 - ELM ST @ MONUMENT	2		0		9					2	2		0		6
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		9					2	0		0		6
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		9					2	0		0		6
6400 - 8866 - MAIN ST @ EATON AVE	0		0		9					2	0		0		6
6800 - 8867 - 646 MAIN ST	0		0		9					2	0		0		6
7200 - 8868 - MAIN ST @ CHARLES ST	0		0		9					2	0		0		6
7600 - 8869 - MAIN ST @ KILBY ST	0		0		9					2	1.5		0.5		7
8000 - 8870 - 466 MAIN ST OPP UNION ST	0		0		9					2	1.5		1		7.5
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	4		1		12					2	3		0		10.5
8800 - 6941 - MAIN ST @ MYRTLE ST	0		0		12					2	0.5		0		11
9200 - 6942 - 226 MAIN ST OPP GREEN ST	2		0		14					2	0.5		0		11.5
9600 - 6943 - MAIN ST @ WARREN AVE	1		0		15					2	0		0		11.5
10000 - 6944 - MAIN ST @ RICHARDSON ST	0		0		15					2	0		0		11.5
10400 - 6945 - 96 MAIN ST	0		0		15					2	0.5		0		12
10800 - 6946 - MAIN ST @ LYDON CT	0		0		15					2	1		0		13
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0		0		15					2	0		0		13
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0		0		15					2	0		0		13
12000 - 6949 - MAIN ST @ CANAL ST	0		0		15					2	0		0		13
12400 - 6950 - MAIN ST @ CLARK ST	2		0		17					2	0		0		13
12800 - 6951 - MAIN ST @ LAKE ST	0		0		17					2	0		0.5		12.5
13200 - 6952 - MAIN ST @ VINE ST	0		0		17					2	0		0		12.5
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	1		0		18					2	0.5		0.5		12.5
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		18					2	0		0		12.5
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		18					2	0		0		12.5
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		18					2	0		0		12.5
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		18					2	0		0		12.5
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		18					2	0		0		12.5
16000 - 6958 - 104 MAIN ST	0		0		18					2	0		0		12.5
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		18					2	0		0		12.5
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		18					2	0		0		12.5

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	10:10 (134.5) [1] !Fall 2012!					11:05 (134.6) [2] !Fall 2012!					11:10 (134.5) [2] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		18					2	0		0		12.5
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		18	0		0		2	0		0		12.5
18000 - 9146 - 578 WINTHROP ST.	0		0		18	0		0		2	0		0		12.5
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		18	1.5		0		3.5	1		0		13.5
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		18	0		0		3.5	0		0		13.5
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		18	0		0		3.5	0		0		13.5
19600 - 5008 - 300 WINTHROP ST	0		0		18	0		0		3.5	0		0.5		13
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		18	1.5		0		5	0		0		13
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		18	2		0		7	0		0.5		12.5
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		18	1		0		8	0.5		0.5		12.5
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					18					8					12.5
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	6		4		20	3.5		0.5		11	0.5		0.5		12.5
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	1		0		21	2.5		0		13.5	0		0		12.5
22400 - 9152 - 163 RIVERSIDE AVE	0		0		21	0.5		0		14	0		0		12.5
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		21	0		0		14	0		0		12.5
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		21	0		0		14	0		0		12.5
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		21	1		0		15	0		0		12.5
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		21	0		0		15	0		0		12.5
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		21	0		0		15	0.5		1		12
26000 - 49157 - 61 LOCUST ST	4		1		24	0		0.5		14.5	1		0		13
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	5		5		24	5		5		14.5	3.5		0.5		16
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		24	0.5		0		15	0		0		16
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		24	0		0		15	0		0		16
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		24	0		0		15	0		0		16
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		24	0		1.5		13.5	0		0		16
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		25	0.5		0		14	0		0.5		15.5
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1		1		25	0.5		0		14.5	0.5		0		16
29200 - 5271 - WELLINGTON STATION BUSWAY	0		21	2	2	0		12.5	2	0	0		15	1	0
Maximum					25					15					16
Total	35		33			20		20			21.5		21.5		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	12:05 (134.6) [1] !Fall 2012!					12:10 (134.5) [3] !Spring 2013!					13:05 (134.6) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		2			2	1	2	0		3		2			2
800 - 8853 - 1076 MAIN ST					2	0		0		3					2
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					2	0		0		3					2
1600 - 8855 - MAIN ST @ MOUNTAIN ST					2	0.3		0		3.3					2
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					2	0.3		0		3.6					2
2400 - 8857 - 940 MAIN ST					2	0		0		3.6					2
2800 - 8858 - MAIN ST @ NICHOLS ST					2	2		0		5.6					2
3600 - 8860 - ELM ST @ TRAVERSE ST					2	0.7		0		6.3					2
4000 - 8861 - ELM ST @ WARD ST					2	0		0		6.3					2
4400 - 8862 - ELM ST @ WEST ST					2	0		0		6.3					2
4800 - 8863 - ELM ST @ MONUMENT					2	1		0.7		6.6					2
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					2	0		0.7		5.9					2
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					2	0		0		5.9					2
6400 - 8866 - MAIN ST @ EATON AVE					2	0		0		5.9					2
6800 - 8867 - 646 MAIN ST					2	0.3		0		6.2					2
7200 - 8868 - MAIN ST @ CHARLES ST					2	0		0		6.2					2
7600 - 8869 - MAIN ST @ KILBY ST					2	0		0		6.2					2
8000 - 8870 - 466 MAIN ST OPP UNION ST					2	1.3		0.3		7.2					2
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					2	1.7		0		8.9					2
8800 - 6941 - MAIN ST @ MYRTLE ST					2	0.3		0		9.2					2
9200 - 6942 - 226 MAIN ST OPP GREEN ST					2	2.3		0		11.5					2
9600 - 6943 - MAIN ST @ WARREN AVE					2	0		0		11.5					2
10000 - 6944 - MAIN ST @ RICHARDSON ST					2	0		0		11.5					2
10400 - 6945 - 96 MAIN ST					2	0.3		0		11.8					2
10800 - 6946 - MAIN ST @ LYDON CT					2	0.3		0		12.1					2
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					2	0		0		12.1					2
11600 - 6948 - MAIN ST @ HEMINGWAY ST					2	0		0		12.1					2
12000 - 6949 - MAIN ST @ CANAL ST					2	0.3		0		12.4					2
12400 - 6950 - MAIN ST @ CLARK ST					2	0.3		0		12.7					2
12800 - 6951 - MAIN ST @ LAKE ST					2	1		0		13.7					2
13200 - 6952 - MAIN ST @ VINE ST					2	0.3		0		14					2
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					2	1.7		0.7		15					2
14000 - 6953 - MAIN ST @ WASHINGTON ST					2	0		0		15					2
14400 - 6954 - MAIN ST @ MYSTIC AVE					2	0		0		15					2
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					2	0		0		15					2
15200 - 6956 - MAIN ST @ W MADISON AVE					2	0		0		15					2
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					2	0		0		15					2
16000 - 6958 - 104 MAIN ST					2	0		0		15					2
16400 - 6959 - MAIN ST @ GATEWAY S					2	0		0		15					2
16800 - 6960 - WINTHROP ST @ ROBINSON RD					2	0		0		15					2

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	12:05 (134.6) [1] !Fall 2012!					12:10 (134.5) [3] !Spring 2013!					13:05 (134.6) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					2	0		0		15					2
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		2	1		0.7		15.3	3		0		5
18000 - 9146 - 578 WINTHROP ST.	0		0		2	0		0		15.3	0		0		5
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		2	0.7		0		16	1.3		0		6.3
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		2	0		0		16	0		0		6.3
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	2		0		4	0		0		16	0		0		6.3
19600 - 5008 - 300 WINTHROP ST	0		0		4	0.3		0		16.3	1		0		7.3
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		4	0		0		16.3	0.7		0		8
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		4	0		0		16.3	0		0		8
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		4	0		2.7		13.6	0.3		0		8.3
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					4					13.6					8.3
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3		0		7	4.7		1.3		17	3.3		0.7		10.9
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	2		0		9	0		0		17	1		0		11.9
22400 - 9152 - 163 RIVERSIDE AVE	0		0		9	0		0		17	0		0		11.9
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		9	0.7		0		17.7	0		0		11.9
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		9	0.7		0		18.4	0.3		0		12.2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		9	0.3		0		18.7	0.3		0.3		12.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		9	1.3		0.7		19.3	0.7		0		12.9
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		9	0		0.7		18.6	0.7		0.7		12.9
26000 - 49157 - 61 LOCUST ST	0		0		9	2.3		1.7		19.2	2		3.3		11.6
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	5		2		12	6		1		24.2	7		0.7		17.9
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		12	0		0		24.2	0		0		17.9
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		12	0		0		24.2	0		0		17.9
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		12	0		0		24.2	0		0		17.9
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		1		11	0		1		23.2	0		0		17.9
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	8		0		19	4.3		2.7		24.8	0.7		0.3		18.3
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		19	1.3		0.7		25.4	1		0.3		19
29200 - 5271 - WELLINGTON STATION BUSWAY	0		17	2	0	0		25	2	-1.6	0		17	2	0
Maximum					19					25.4					19
Total	20		20			39.3		40.3			23.3		23.3		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	13:10 (134.5) [2] !Fall 2012!					14:05 (134.6) [1] !Fall 2012!					14:10 (134.5) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	0.5	2	0		2.5		2			2	2	2	0		4
800 - 8853 - 1076 MAIN ST	0		0		2.5					2	0		0		4
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		2.5					2	0.7		0		4.7
1600 - 8855 - MAIN ST @ MOUNTAIN ST	1.5		0		4					2	0.3		0		5
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0.5		0		4.5					2	0		0		5
2400 - 8857 - 940 MAIN ST	0		0		4.5					2	0		0		5
2800 - 8858 - MAIN ST @ NICHOLS ST	1		0.5		5					2	0		0		5
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		5					2	0		0.3		4.7
4000 - 8861 - ELM ST @ WARD ST	0		0		5					2	0		0		4.7
4400 - 8862 - ELM ST @ WEST ST	0		0		5					2	0		0		4.7
4800 - 8863 - ELM ST @ MONUMENT	4		1		8					2	2.7		0		7.4
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	0		0		8					2	0		0		7.4
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		8					2	0		0		7.4
6400 - 8866 - MAIN ST @ EATON AVE	0		0		8					2	0.3		0		7.7
6800 - 8867 - 646 MAIN ST	0		0		8					2	0		0		7.7
7200 - 8868 - MAIN ST @ CHARLES ST	0		0		8					2	0		0		7.7
7600 - 8869 - MAIN ST @ KILBY ST	0		1		7					2	0		0.3		7.4
8000 - 8870 - 466 MAIN ST OPP UNION ST	2		1.5		7.5					2	2		0.3		9.1
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	3.5		0.5		10.5					2	2.7		0		11.8
8800 - 6941 - MAIN ST @ MYRTLE ST	1.5		0		12					2	0.3		0		12.1
9200 - 6942 - 226 MAIN ST OPP GREEN ST	3		0		15					2	0		0.3		11.8
9600 - 6943 - MAIN ST @ WARREN AVE	0		1		14					2	0		0		11.8
10000 - 6944 - MAIN ST @ RICHARDSON ST	0.5		0.5		14					2	0.3		0		12.1
10400 - 6945 - 96 MAIN ST	0		0		14					2	0		0		12.1
10800 - 6946 - MAIN ST @ LYDON CT	0		0		14					2	0.7		0		12.8
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0		0		14					2	0.3		0		13.1
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0.5		0		14.5					2	0		0		13.1
12000 - 6949 - MAIN ST @ CANAL ST	0.5		0		15					2	0.7		0.7		13.1
12400 - 6950 - MAIN ST @ CLARK ST	0.5		0		15.5					2	0		0		13.1
12800 - 6951 - MAIN ST @ LAKE ST	1		0		16.5					2	0		0.3		12.8
13200 - 6952 - MAIN ST @ VINE ST	0.5		0		17					2	0		0		12.8
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	1.5		0		18.5					2	1		0		13.8
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		18.5					2	0		0		13.8
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		18.5					2	0		0		13.8
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	1		0		19.5					2	0		0		13.8
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		19.5					2	0		0		13.8
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		19.5					2	0		0		13.8
16000 - 6958 - 104 MAIN ST	0		0		19.5					2	0		0		13.8
16400 - 6959 - MAIN ST @ GATEWAY S	0		0.5		19					2	0		0		13.8
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		19					2	0		0		13.8

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
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(Urban Transportation Associates)

	Trip (RouteVar) [Observations]														
	13:10 (134.5) [2] !Fall 2012!					14:05 (134.6) [1] !Fall 2012!					14:10 (134.5) [3] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		19					2	0		0		13.8
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0.5		18.5	0		0		2	0.3		0.3		13.8
18000 - 9146 - 578 WINTHROP ST.	0		0		18.5	0		0		2	0		0		13.8
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	1.5		0		20	2		0		4	1.3		0		15.1
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		20	0		0		4	0		0		15.1
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		20	0		0		4	0		0		15.1
19600 - 5008 - 300 WINTHROP ST	0		0		20	0		0		4	0.3		0		15.4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.5		0		20.5	0		0		4	0.7		0		16.1
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		20.5	0		0		4	0		0		16.1
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0.5		2		19	0		0		4	0		0.3		15.8
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					19					4					15.8
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3		2		20	2		0		6	1.7		1		16.5
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		20	0		0		6	0		0		16.5
22400 - 9152 - 163 RIVERSIDE AVE	0		0		20	0		0		6	0		0		16.5
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0.5		0.5		20	1		0		7	0		0		16.5
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		20	0		0		7	0.3		1		15.8
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		20	0		0		7	0		0		15.8
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		20	0		0		7	1.3		0		17.1
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		20	0		0		7	0		0		17.1
26000 - 49157 - 61 LOCUST ST	3.5		1		22.5	2		0		9	0.3		0		17.4
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	11		4		29.5	16		1		24	10		2.3		25.1
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		29.5	1		0		25	0		0		25.1
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0.5		0		30	0		0		25	0		0		25.1
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		30	0		1		24	0		0.3		24.8
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		2		28	0		3		21	0		0		24.8
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	2		0		30	5		0		26	1.3		0.7		25.4
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.5		1		29.5	1		0		27	0.3		1.3		24.4
29200 - 5271 - WELLINGTON STATION BUSWAY	0		27.5	2	0	0		26	2	-1	0		22.3	2	0.1
Maximum					30					27					25.4
Total	47		47			30		31			32		32		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	15:05 (134.6) [2] !Fall 2012!					15:10 (134.5) [3] !Fall 2012!					16:05 (134.6) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		2			2	1.3	2	0		3.3		2			2
800 - 8853 - 1076 MAIN ST					2	0		0		3.3					2
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					2	0		0		3.3					2
1600 - 8855 - MAIN ST @ MOUNTAIN ST					2	0.3		0		3.6					2
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					2	0		0		3.6					2
2400 - 8857 - 940 MAIN ST					2	0		0		3.6					2
2800 - 8858 - MAIN ST @ NICHOLS ST					2	0.7		0		4.3					2
3600 - 8860 - ELM ST @ TRAVERSE ST					2	0.3		0		4.6					2
4000 - 8861 - ELM ST @ WARD ST					2	0		0		4.6					2
4400 - 8862 - ELM ST @ WEST ST					2	0		0		4.6					2
4800 - 8863 - ELM ST @ MONUMENT					2	1.3		0.3		5.6					2
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					2	1		0		6.6					2
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					2	0		0		6.6					2
6400 - 8866 - MAIN ST @ EATON AVE					2	0		0		6.6					2
6800 - 8867 - 646 MAIN ST					2	0.7		0		7.3					2
7200 - 8868 - MAIN ST @ CHARLES ST					2	0.3		0		7.6					2
7600 - 8869 - MAIN ST @ KILBY ST					2	0.3		0		7.9					2
8000 - 8870 - 466 MAIN ST OPP UNION ST					2	0.7		0.3		8.3					2
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					2	2		0		10.3					2
8800 - 6941 - MAIN ST @ MYRTLE ST					2	0.3		0		10.6					2
9200 - 6942 - 226 MAIN ST OPP GREEN ST					2	0.7		0		11.3					2
9600 - 6943 - MAIN ST @ WARREN AVE					2	0		0		11.3					2
10000 - 6944 - MAIN ST @ RICHARDSON ST					2	0		0		11.3					2
10400 - 6945 - 96 MAIN ST					2	0.3		0.3		11.3					2
10800 - 6946 - MAIN ST @ LYDON CT					2	0		0		11.3					2
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					2	0		0		11.3					2
11600 - 6948 - MAIN ST @ HEMINGWAY ST					2	0.3		0		11.6					2
12000 - 6949 - MAIN ST @ CANAL ST					2	0.7		0		12.3					2
12400 - 6950 - MAIN ST @ CLARK ST					2	0.7		0		13					2
12800 - 6951 - MAIN ST @ LAKE ST					2	0.3		0		13.3					2
13200 - 6952 - MAIN ST @ VINE ST					2	0		0		13.3					2
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					2	1.7		0		15					2
14000 - 6953 - MAIN ST @ WASHINGTON ST					2	0		0		15					2
14400 - 6954 - MAIN ST @ MYSTIC AVE					2	0		0		15					2
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					2	0		0		15					2
15200 - 6956 - MAIN ST @ W MADISON AVE					2	0		0		15					2
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					2	0		0		15					2
16000 - 6958 - 104 MAIN ST					2	0		0		15					2
16400 - 6959 - MAIN ST @ GATEWAY S					2	0		0		15					2
16800 - 6960 - WINTHROP ST @ ROBINSON RD					2	0		0		15					2

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	15:05 (134.6) [2] !Fall 2012!					15:10 (134.5) [3] !Fall 2012!					16:05 (134.6) [4] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					2	0.3		0		15.3					2
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		2	0.3		0		15.6	1.3		0		3.3
18000 - 9146 - 578 WINTHROP ST.	0		0		2	0		0		15.6	0		0		3.3
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	1		0		3	0.3		0		15.9	0.8		0		4.1
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		3	0		0		15.9	1.3		0		5.4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		3	0		0		15.9	0		0		5.4
19600 - 5008 - 300 WINTHROP ST	3		0		6	0		0.3		15.6	0.3		0		5.7
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0.5		0		6.5	0		0		15.6	1.3		0		7
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		6.5	0		0		15.6	0		0		7
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0.5		6	0		0.7		14.9	0.5		0.3		7.2
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					6					14.9					7.2
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	6.5		0.5		12	1.7		1.3		15.3	5.3		0.3		12.2
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0.5		11.5	0.7		0		16	0.5		0		12.7
22400 - 9152 - 163 RIVERSIDE AVE	0		0		11.5	0		0		16	0		0		12.7
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		11.5	0		0		16	0		0		12.7
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		11.5	0		0		16	0.5		0		13.2
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		11.5	0.3		0		16.3	0.3		0.5		13
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0.5		0		12	1		0		17.3	0		0		13
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0.5		0.5		12	0.3		0		17.6	0		0		13
26000 - 49157 - 61 LOCUST ST	3		1.5		13.5	0		0.3		17.3	2		0.8		14.2
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	17		2		28.5	8.3		2		23.6	10		1.3		22.9
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	1.5		0		30	0.3		0		23.9	1		0		23.9
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		30	0		0		23.9	0		0		23.9
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		30	0		0		23.9	0		0		23.9
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0.5		29.5	0.3		0.3		23.9	0		0.5		23.4
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	4		4		29.5	0.7		0		24.6	0.8		0.5		23.7
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		29.5	1.3		0.3		25.6	1		1		23.7
29200 - 5271 - WELLINGTON STATION BUSWAY	0		28	2	-0.5	0		23.7	2	-0.1	0		21.5	2	0.2
Maximum					30					25.6					23.9
Total	37.5		38			30		30			26.5		26.5		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

	16:10 (134.5) [1] !Fall 2012!					17:05 (134.6) [3] !Fall 2012!					17:10 (134.5) [1] !Fall 2012!				
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST	3	2	0		5		2			2	1	1	0		2
800 - 8853 - 1076 MAIN ST	0		0		5					2	0		0		2
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST	0		0		5					2	0		0		2
1600 - 8855 - MAIN ST @ MOUNTAIN ST	0		0		5					2	0		0		2
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE	0		0		5					2	0		0		2
2400 - 8857 - 940 MAIN ST	0		0		5					2	0		0		2
2800 - 8858 - MAIN ST @ NICHOLS ST	0		0		5					2	1		0		3
3600 - 8860 - ELM ST @ TRAVERSE ST	0		0		5					2	0		0		3
4000 - 8861 - ELM ST @ WARD ST	0		0		5					2	0		0		3
4400 - 8862 - ELM ST @ WEST ST	0		0		5					2	0		0		3
4800 - 8863 - ELM ST @ MONUMENT	0		0		5					2	0		0		3
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK	4		0		9					2	0		0		3
6000 - 8865 - MAIN ST OPP CAPOZZI CIR	0		0		9					2	0		0		3
6400 - 8866 - MAIN ST @ EATON AVE	0		0		9					2	0		0		3
6800 - 8867 - 646 MAIN ST	0		0		9					2	0		0		3
7200 - 8868 - MAIN ST @ CHARLES ST	0		0		9					2	0		0		3
7600 - 8869 - MAIN ST @ KILBY ST	0		0		9					2	0		0		3
8000 - 8870 - 466 MAIN ST OPP UNION ST	3		1		11					2	2		0		5
8400 - 9125 - COMMON ST @ WOBURN CITY HALL	3		0		14					2	0		0		5
8800 - 6941 - MAIN ST @ MYRTLE ST	2		0		16					2	0		0		5
9200 - 6942 - 226 MAIN ST OPP GREEN ST	0		1		15					2	0		0		5
9600 - 6943 - MAIN ST @ WARREN AVE	0		0		15					2	0		0		5
10000 - 6944 - MAIN ST @ RICHARDSON ST	0		0		15					2	1		0		6
10400 - 6945 - 96 MAIN ST	0		0		15					2	0		0		6
10800 - 6946 - MAIN ST @ LYDON CT	0		0		15					2	0		0		6
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE	0		0		15					2	0		0		6
11600 - 6948 - MAIN ST @ HEMINGWAY ST	0		0		15					2	0		0		6
12000 - 6949 - MAIN ST @ CANAL ST	2		0		17					2	0		0		6
12400 - 6950 - MAIN ST @ CLARK ST	0		0		17					2	0		0		6
12800 - 6951 - MAIN ST @ LAKE ST	0		0		17					2	0		0		6
13200 - 6952 - MAIN ST @ VINE ST	0		0		17					2	0		0		6
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR	8		0		25					2	0		0		6
14000 - 6953 - MAIN ST @ WASHINGTON ST	0		0		25					2	1		0		7
14400 - 6954 - MAIN ST @ MYSTIC AVE	0		0		25					2	0		0		7
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY	0		0		25					2	2		0		9
15200 - 6956 - MAIN ST @ W MADISON AVE	0		0		25					2	0		0		9
15600 - 6957 - MAIN ST @ RIDGEFIELD RD	0		0		25					2	0		0		9
16000 - 6958 - 104 MAIN ST	0		0		25					2	0		0		9
16400 - 6959 - MAIN ST @ GATEWAY S	0		0		25					2	0		0		9
16800 - 6960 - WINTHROP ST @ ROBINSON RD	0		0		25					2	0		0		9

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	16:10 (134.5) [1] !Fall 2012!					17:05 (134.6) [3] !Fall 2012!					17:10 (134.5) [1] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY	0		0		25					2	0		0		9
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		25	0		0		2	0		0		9
18000 - 9146 - 578 WINTHROP ST.	0		0		25	0		0		2	0		0		9
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		25	0		0		2	0		0		9
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		25	0		0		2	0		0		9
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		25	0		0		2	0		0		9
19600 - 5008 - 300 WINTHROP ST	0		0		25	0		0		2	0		0		9
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		3		22	0		0		2	0		0		9
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		22	0		0		2	0		0		9
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		2		20	1		0		3	1		1		9
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					20					3					9
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	1		0		21	1.7		0		4.7	2		1		10
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		21	0		0		4.7	1		0		11
22400 - 9152 - 163 RIVERSIDE AVE	0		0		21	0		0		4.7	0		0		11
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		21	0.3		0		5	0		0		11
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		21	0		0		5	0		1		10
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		21	0		0.3		4.7	0		1		9
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	3		0		24	0.3		0.7		4.3	0		0		9
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		24	0		0		4.3	0		0		9
26000 - 49157 - 61 LOCUST ST	2		0		26	1.3		0		5.6	0		0		9
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	7		7		26	14.3		0.7		19.2	12		1		20
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	1		0		27	0		0		19.2	0		0		20
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		27	0		0		19.2	0		0		20
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		27	0		0		19.2	0		0		20
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		2		25	0		0		19.2	0		1		19
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	5		3		27	1.7		0		20.9	0		0		19
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		27	1.3		0.3		21.9	1		0		20
29200 - 5271 - WELLINGTON STATION BUSWAY	0		25	2	0	0		20.3	2	-0.4	0		18	1	1
Maximum					27					21.9					20
Total	44		44			22		22.3			25		24		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	18:05 (134.6) [1] !Fall 2012!					18:10 (134.5) [4] !Fall 2012!					19:00 (134.5) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		1			1	1.5	2	0		3.5	0.3	4	0		4.3
800 - 8853 - 1076 MAIN ST					1	0		0		3.5	0		0		4.3
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					1	0		0		3.5	0		0		4.3
1600 - 8855 - MAIN ST @ MOUNTAIN ST					1	0		0		3.5	0		0		4.3
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					1	0		0		3.5	0		0		4.3
2400 - 8857 - 940 MAIN ST					1	0		0		3.5	0		0		4.3
2800 - 8858 - MAIN ST @ NICHOLS ST					1	0.3		0		3.8	0		0		4.3
3600 - 8860 - ELM ST @ TRAVERSE ST					1	0.3		0		4.1	0		0		4.3
4000 - 8861 - ELM ST @ WARD ST					1	0		0		4.1	0		0		4.3
4400 - 8862 - ELM ST @ WEST ST					1	0		0		4.1	0		0		4.3
4800 - 8863 - ELM ST @ MONUMENT					1	1.8		0.3		5.6	0.3		0		4.6
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					1	0.3		0		5.9	0.3		0		4.9
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					1	0		0		5.9	0		0		4.9
6400 - 8866 - MAIN ST @ EATON AVE					1	0		0		5.9	0		0		4.9
6800 - 8867 - 646 MAIN ST					1	0		0		5.9	0		0		4.9
7200 - 8868 - MAIN ST @ CHARLES ST					1	0		0		5.9	0.3		0		5.2
7600 - 8869 - MAIN ST @ KILBY ST					1	0		0		5.9	1		0		6.2
8000 - 8870 - 466 MAIN ST OPP UNION ST					1	2.5		0.3		8.1	0		0.3		5.9
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					1	4		0.3		11.8	0.7		0		6.6
8800 - 6941 - MAIN ST @ MYRTLE ST					1	0.3		0		12.1	2.3		0		8.9
9200 - 6942 - 226 MAIN ST OPP GREEN ST					1	0		0.3		11.8	0		0		8.9
9600 - 6943 - MAIN ST @ WARREN AVE					1	1		0.3		12.5	1		0		9.9
10000 - 6944 - MAIN ST @ RICHARDSON ST					1	0.3		0		12.8	0		0		9.9
10400 - 6945 - 96 MAIN ST					1	0		0		12.8	0.3		0		10.2
10800 - 6946 - MAIN ST @ LYDON CT					1	0.5		0		13.3	0.3		0		10.5
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					1	0		0		13.3	0		0		10.5
11600 - 6948 - MAIN ST @ HEMINGWAY ST					1	0		0		13.3	0		0		10.5
12000 - 6949 - MAIN ST @ CANAL ST					1	0.5		0		13.8	0		0		10.5
12400 - 6950 - MAIN ST @ CLARK ST					1	0		0		13.8	0.3		0		10.8
12800 - 6951 - MAIN ST @ LAKE ST					1	0		0.3		13.5	0.3		0		11.1
13200 - 6952 - MAIN ST @ VINE ST					1	0		0		13.5	0		0		11.1
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					1	0.8		0.3		14	0		0.3		10.8
14000 - 6953 - MAIN ST @ WASHINGTON ST					1	0		0		14	0		0		10.8
14400 - 6954 - MAIN ST @ MYSTIC AVE					1	0		0		14	0		0		10.8
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					1	0		0		14	0		0		10.8
15200 - 6956 - MAIN ST @ W MADISON AVE					1	0		0		14	0.3		0		11.1
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					1	0.3		0		14.3	0		0		11.1
16000 - 6958 - 104 MAIN ST					1	0		0		14.3	0		0		11.1
16400 - 6959 - MAIN ST @ GATEWAY S					1	0		0		14.3	0		0		11.1
16800 - 6960 - WINTHROP ST @ ROBINSON RD					1	0		0		14.3	0		0		11.1

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	18:05 (134.6) [1] !Fall 2012!					18:10 (134.5) [4] !Fall 2012!					19:00 (134.5) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					1	0		0		14.3	0.3		0		11.4
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD	0		0		1	0		0.5		13.8	0		0		11.4
18000 - 9146 - 578 WINTHROP ST.	0		0		1	0		0		13.8	0		0		11.4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED	0		0		1	0.5		0		14.3	0		0		11.4
18800 - 9149 - WINTHROP ST @ EXETER ST	0		0		1	0		0		14.3	0		0		11.4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST	0		0		1	0		0.3		14	0		0		11.4
19600 - 5008 - 300 WINTHROP ST	0		0		1	0		0		14	0		0		11.4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH	0		0		1	0		0		14	0.7		0.3		11.8
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD	0		0		1	0		0		14	0		0		11.8
20800 - 6324 - HIGH ST OPP GOVERNORS AVE	0		0		1	0		0.3		13.7	0		0.7		11.1
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN					1					13.7					11.1
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3		0		4	0.8		0.3		14.2	0.3		0.3		11.1
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO	0		0		4	0.3		0		14.5	0		0		11.1
22400 - 9152 - 163 RIVERSIDE AVE	0		0		4	0		0		14.5	0		0		11.1
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		4	0		0.8		13.7	0		0		11.1
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	1		0		5	0		0		13.7	0		0		11.1
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		5	0		0		13.7	0		0		11.1
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		5	0.5		0		14.2	1		0		12.1
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	3		0		8	0		0.3		13.9	0		0		12.1
26000 - 49157 - 61 LOCUST ST	1		3		6	1		0.3		14.6	0.3		0.3		12.1
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	13		0		19	7.8		0.3		22.1	4.3		0.7		15.7
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		19	0		0		22.1	0.7		0		16.4
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		19	0		0		22.1	0		0		16.4
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		19	0		0		22.1	0		0.3		16.1
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		19	0		1		21.1	0		0		16.1
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	1		0		20	0.8		0		21.9	0.7		0		16.8
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	1		0		21	0.3		0.8		21.4	0		0		16.8
29200 - 5271 - WELLINGTON STATION BUSWAY	0		20	1	0	0		19.5	2	-0.1	0		13	4	-0.2
Maximum					21					22.1					16.8
Total	23		23			25.8		25.8			16.3		16.3		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	20:15 (134.7) [2] !Fall 2012!					20:55 (134.7) [1] !Fall 2012!					21:55 (134.7) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 8852 - MAIN ST @ N MAPLE ST		2			2		2			2		4			4
800 - 8853 - 1076 MAIN ST					2					2					4
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					2					2					4
1600 - 8855 - MAIN ST @ MOUNTAIN ST					2					2					4
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					2					2					4
2400 - 8857 - 940 MAIN ST					2					2					4
2800 - 8858 - MAIN ST @ NICHOLS ST					2					2					4
3600 - 8860 - ELM ST @ TRAVERSE ST					2					2					4
4000 - 8861 - ELM ST @ WARD ST					2					2					4
4400 - 8862 - ELM ST @ WEST ST					2					2					4
4800 - 8863 - ELM ST @ MONUMENT					2					2					4
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					2					2					4
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					2					2					4
6400 - 8866 - MAIN ST @ EATON AVE					2					2					4
6800 - 8867 - 646 MAIN ST					2					2					4
7200 - 8868 - MAIN ST @ CHARLES ST					2					2					4
7600 - 8869 - MAIN ST @ KILBY ST					2					2					4
8000 - 8870 - 466 MAIN ST OPP UNION ST					2					2					4
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					2					2					4
8800 - 6941 - MAIN ST @ MYRTLE ST					2					2					4
9200 - 6942 - 226 MAIN ST OPP GREEN ST					2					2					4
9600 - 6943 - MAIN ST @ WARREN AVE					2					2					4
10000 - 6944 - MAIN ST @ RICHARDSON ST					2					2					4
10400 - 6945 - 96 MAIN ST					2					2					4
10800 - 6946 - MAIN ST @ LYDON CT					2					2					4
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					2					2					4
11600 - 6948 - MAIN ST @ HEMINGWAY ST					2					2					4
12000 - 6949 - MAIN ST @ CANAL ST					2					2					4
12400 - 6950 - MAIN ST @ CLARK ST					2					2					4
12800 - 6951 - MAIN ST @ LAKE ST					2					2					4
13200 - 6952 - MAIN ST @ VINE ST					2					2					4
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					2					2					4
14000 - 6953 - MAIN ST @ WASHINGTON ST					2					2					4
14400 - 6954 - MAIN ST @ MYSTIC AVE					2					2					4
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					2					2					4
15200 - 6956 - MAIN ST @ W MADISON AVE					2					2					4
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					2					2					4
16000 - 6958 - 104 MAIN ST					2					2					4
16400 - 6959 - MAIN ST @ GATEWAY S					2					2					4
16800 - 6960 - WINTHROP ST @ ROBINSON RD					2					2					4

Massachusetts Bay Transportation Authority
Route 134
Saturday - Inbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	20:15 (134.7) [2] !Fall 2012!					20:55 (134.7) [1] !Fall 2012!					21:55 (134.7) [3] !Fall 2012!				
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					2					2					4
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD					2					2					4
18000 - 9146 - 578 WINTHROP ST.					2					2					4
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED					2					2					4
18800 - 9149 - WINTHROP ST @ EXETER ST					2					2					4
19200 - 9150 - WINTHROP ST @ SUFFOLK ST					2					2					4
19600 - 5008 - 300 WINTHROP ST					2					2					4
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH					2					2					4
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD					2					2					4
20800 - 6324 - HIGH ST OPP GOVERNORS AVE					2					2					4
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0.8		0		2.8	0		0		2	0.4		0		4.4
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	3.5		0		6.3	2		0		4	0.5		0		4.9
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO					6.3					4					4.9
22400 - 9152 - 163 RIVERSIDE AVE	0		0		6.3	0		0		4	0		0		4.9
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		6.3	0		0		4	0		0		4.9
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		6.3	0		0		4	0		0		4.9
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		6.3	0		2		2	0.3		0		5.2
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	2		0		8.3	0		0		2	0		0		5.2
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		8.3	0		0		2	0		0		5.2
26000 - 49157 - 61 LOCUST ST	2		0		10.3	3		0		5	0.3		0		5.5
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	12.5		1		21.8	5		0		10	12		0.3		17.2
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		21.8	0		0		10	0		0		17.2
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		21.8	0		0		10	0		0		17.2
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		21.8	0		0		10	0		0		17.2
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		21.8	0		0		10	0		0.3		16.9
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	2.5		0		24.3	0		0		10	1		0.3		17.6
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0.5		0		24.8	0		0		10	0.7		0.7		17.6
29200 - 5271 - WELLINGTON STATION BUSWAY	0		22	2	0.8	0		8	2	0	0		13.7	4	-0.1
Maximum					24.8					10					17.6
Total	23.8		23			10		10			15.2		15.3		

Massachusetts Bay Transportation Authority
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Seq - StopID - Stop Name	22:55 (134.7) [1] !Fall 2012!					23:55 (134.7) [3] !Fall 2012!					Total		
	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Total
400 - 8852 - MAIN ST @ N MAPLE ST		5			5		9			9	15.1	0	81.1
800 - 8853 - 1076 MAIN ST					5					9	0	0	81.1
1200 - 8854 - 1032 MAIN ST OPP WHEELING ST					5					9	0.7	0	81.8
1600 - 8855 - MAIN ST @ MOUNTAIN ST					5					9	5.4	0	87.2
2000 - 8856 - MAIN ST @ ALTAVESTA CIRCLE					5					9	1.3	0	88.5
2400 - 8857 - 940 MAIN ST					5					9	0	0	88.5
2800 - 8858 - MAIN ST @ NICHOLS ST					5					9	12.7	0.5	100.7
3600 - 8860 - ELM ST @ TRAVERSE ST					5					9	2.3	0.8	102.2
4000 - 8861 - ELM ST @ WARD ST					5					9	0.5	0	102.7
4400 - 8862 - ELM ST @ WEST ST					5					9	1	0	103.7
4800 - 8863 - ELM ST @ MONUMENT					5					9	24.8	2.3	126.2
5600 - 8864 - MAIN ST @ MIDDLESEX CANAL PK					5					9	5.6	0.7	131.1
6000 - 8865 - MAIN ST OPP CAPOZZI CIR					5					9	0	0	131.1
6400 - 8866 - MAIN ST @ EATON AVE					5					9	0.3	0	131.4
6800 - 8867 - 646 MAIN ST					5					9	1.7	0	133.1
7200 - 8868 - MAIN ST @ CHARLES ST					5					9	0.6	0	133.7
7600 - 8869 - MAIN ST @ KILBY ST					5					9	6.3	1.8	138.2
8000 - 8870 - 466 MAIN ST OPP UNION ST					5					9	20.7	9	149.9
8400 - 9125 - COMMON ST @ WOBURN CITY HALL					5					9	29.8	1.8	177.9
8800 - 6941 - MAIN ST @ MYRTLE ST					5					9	7.5	0	185.4
9200 - 6942 - 226 MAIN ST OPP GREEN ST					5					9	8.5	1.6	192.3
9600 - 6943 - MAIN ST @ WARREN AVE					5					9	4.7	1.3	195.7
10000 - 6944 - MAIN ST @ RICHARDSON ST					5					9	3.1	0.5	198.3
10400 - 6945 - 96 MAIN ST					5					9	3.1	0.3	201.1
10800 - 6946 - MAIN ST @ LYDON CT					5					9	4.8	0	205.9
11200 - 6947 - MAIN ST @ SHERIDAN CIRCLE					5					9	0.3	0	206.2
11600 - 6948 - MAIN ST @ HEMINGWAY ST					5					9	1.3	0.3	207.2
12000 - 6949 - MAIN ST @ CANAL ST					5					9	6.5	0.7	213
12400 - 6950 - MAIN ST @ CLARK ST					5					9	3.8	0	216.8
12800 - 6951 - MAIN ST @ LAKE ST					5					9	6.4	2.1	221.1
13200 - 6952 - MAIN ST @ VINE ST					5					9	0.8	0	221.9
13600 - 9110 - LARAWAY RD @ WINCHESTER CTR					5					9	18.9	2.5	238.3
14000 - 6953 - MAIN ST @ WASHINGTON ST					5					9	1	0	239.3
14400 - 6954 - MAIN ST @ MYSTIC AVE					5					9	0	0	239.3
14800 - 6955 - MAIN ST @ LINCOLNSHIRE WAY					5					9	3	0	242.3
15200 - 6956 - MAIN ST @ W MADISON AVE					5					9	0.3	0	242.6
15600 - 6957 - MAIN ST @ RIDGEFIELD RD					5					9	0.3	0	242.9
16000 - 6958 - 104 MAIN ST					5					9	0	0	242.9
16400 - 6959 - MAIN ST @ GATEWAY S					5					9	0	0.5	242.4
16800 - 6960 - WINTHROP ST @ ROBINSON RD					5					9	0	0	242.4

Massachusetts Bay Transportation Authority
Route 134
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Fall 2012
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	22:55 (134.7) [1] !Fall 2012!					23:55 (134.7) [3] !Fall 2012!					Total		
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	Off	Total
17200 - 6961 - WINTHROP ST OPP WINFORD WAY					5					9	0.6	0	243
17600 - 9145 - WINTHROP ST @ PLAYSTEAD RD					5					9	12.9	2	253.9
18000 - 9146 - 578 WINTHROP ST.					5					9	0	0	253.9
18400 - 9147 - WINTHROP ST @ BROOKS ST - MED					5					9	11.9	0	265.8
18800 - 9149 - WINTHROP ST @ EXETER ST					5					9	1.3	0	267.1
19200 - 9150 - WINTHROP ST @ SUFFOLK ST					5					9	2	0.3	268.8
19600 - 5008 - 300 WINTHROP ST					5					9	5.9	0.8	273.9
20000 - 6322 - HIGH ST @ WINTHROP ST - WINTH					5					9	8.4	3.6	278.7
20400 - 6323 - HIGH ST OPP POWDER HOUSE RD					5					9	3.5	1.5	280.7
20800 - 6324 - HIGH ST OPP GOVERNORS AVE					5					9	6.8	11	276.5
21200 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0		0		5	2.3		0		11.3	3.5	0	280
21600 - 63241 - 37 RIVERSIDE AVE @ MEDFORD SQ	2		0		7					11.3	72.2	16.2	336
22000 - 9151 - 121 RIVERSIDE AVE - SENIOR HO					7					11.3	14	0.5	349.5
22400 - 9152 - 163 RIVERSIDE AVE	0		0		7	0		0		11.3	2.5	0	352
22800 - 9153 - RIVERSIDE AVE @ MARINE ST	0		0		7	0		0		11.3	5.3	1.3	356
23200 - 9154 - RIVERSIDE AVE @ MAVERICK ST	0		0		7	0		0		11.3	5.8	2	359.8
23600 - 9155 - RIVERSIDE AVE @ FOSTER CT	0		0		7	0		0		11.3	2.5	4.6	357.7
24000 - 9156 - RIVERSIDE AVE @ LIGHT GUARD D	0		0		7	0		1		10.3	15.1	3.4	369.4
24400 - 9157 - RIVERSIDE AVE @ ROCKWELL AVE	0		0		7	0		0.3		10	6.5	3.5	372.4
26000 - 49157 - 61 LOCUST ST	0		0		7	0		0		10	42.5	20.2	394.7
26400 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0		0		7	0.3		0		10.3	205.8	42.6	557.9
26800 - 9158 - RIVERSIDE AVE @ LOCUST ST	0		0		7	0		0		10.3	9.8	0	567.7
27200 - 9159 - RIVERSIDE AVE @ HALL ST	0		0		7	0		0		10.3	1.5	0	569.2
27600 - 9160 - RIVERSIDE AVE @ COMMERCIAL ST	0		0		7	0.3		0		10.6	0.3	1.6	567.9
28000 - 9161 - RIVERSIDE AVE @ FELLSWAY	0		0		7	0		0		10.6	0.3	15.6	552.6
28400 - 9042 - FELLSWAY @ RIVERSIDE AVE	0		1		6	0		0		10.6	52.3	16.8	588.1
28800 - 9043 - FELLSWAY @ WELLINGTON CIRCLE	0		0		6	0		1		9.6	15.2	11.6	591.7
29200 - 5271 - WELLINGTON STATION BUSWAY	0		1	5	0	0		0.7	9	-0.1	0	524.9	0.8
Maximum					7					11.3	0	0	604
Total	2		2			3		3			711.7	710.1	0

Massachusetts Bay Transportation Authority
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Fall 2012
(Urban Transportation Associates)

	06:15 (134.5) [3] !Fall 2012!					06:40 (134.6) [1] !Fall 2012!					07:10 (134.5) [1] !Fall 2012!					07:40 (13	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
400 - 5271 - WELLINGTON STATION BUSWAY	14.3	0	0		14.3	3	1	0		3	8.5	1	0		8.5	3.5	0
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0.3		0		14.7	0		0		3	0		0		8.5	0.5	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		0.3		14.3	0		0		3	1		0		18	0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		14.3	0		0		3	0		0		18	0	
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	1.3		0		15.7	1		0		4	0		0		18	0	
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0		15.7	0		0		4	0		0		18	0	
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		15.7	0		0		4	0		0		18	0	
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0		15.7	0		0		4	0		0		18	0	
3600 - 49157 - 61 LOCUST ST	0		1		14.7	0		0		4	0		1		17	0	
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	0.3		0		15	0		2		2	1		0		18	0	
4400 - 9165 - 350 RIVERSIDE AVE	0.7		1		14.7	0		1		1	0		0		18	0	
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		0		14.7	0		0		1	0		0		18	1	
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0		14.7	0		0		1	0		0		18	0	
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0		14.7	0		0		1	0		1		17	0	
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0		14.7	0		0		1	0		0		17	0	
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		14.7	0		0		1	0		0		17	0	
6800 - 9172 - 116 RIVERSIDE AVE	0		1.3		13.3	0		0		1	0		0		17	0	
7200 - 5002 - SALEM ST OPP RIVER ST	0		0		13.3	0		0		1	2		1		18	0	
7600 - 15002 - HIGH ST @ BRADLEE RD	0.3		0.7		13	0		0		1	0		0		18	0	
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0		13	0		0		1	0		0		18	0	
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0		13	0		0		1	0		0		18	0	
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		1		12	0		0		1	0		0		18	0	
9200 - 5006 - 305 WINTHROP ST	0		0		12	0		0		1	0		0		18	0	
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		12	0		0		1	0		0		18	0	
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		12	0		0		1	0		0		18	0	
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0		12	0		0		1	0		0		18	0	
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0		12	0		1		0	0		2		16	0	
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		12	0		0		0	0		0		16	0	
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		12	0		0		0	0		0		16	0	
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0		12	.		.		.	0		0		16	.	
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		12	.		.		.	0		0		16	.	
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		12	.		.		.	0		0		16	.	
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		12	.	.	.		.	0		0		16	.	
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		12	.		.		.	0		0		16	.	
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		12	.		.		.	0		0		16	.	
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		12	.		.		.	0		0		16	.	
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		12	.		.		.	0		0		16	.	
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		12	.		.		.	0		0		16	.	
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0		0.3		11.7	.		.		.	0		0		16	.	
16000 - 9111 - MAIN ST @ VINE ST	0		0.3		11.3	.		.		.	0		0		16	.	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	06:15 (134.5) [3] !Fall 2012!					06:40 (134.6) [1] !Fall 2012!					07:10 (134.5) [1] !Fall 2012!					07:40 (13	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
16400 - 9113 - MAIN ST @ LAKE ST	0		0		11.3	.		.		.	0		0		16	.	
16800 - 9114 - 757 MAIN ST	0		0		11.3	.		.		.	0		1		15	.	
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		1.3		10	.		.		.	0		1		14	.	
17600 - 9116 - 955 MAIN ST	0		0		10	.		.		.	0		0		14	.	
18000 - 9117 - 995 MAIN ST	0		0		10	.		.		.	0		0		14	.	
18400 - 9118 - MAIN ST @ CRANES CT	0		0		10	.		.		.	0		0		14	.	
18800 - 9119 - MAIN ST @ VINING CT	0		0		10	.		.		.	0		0		14	.	
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0		10	.		.		.	0		0		14	.	
19600 - 9121 - MAIN ST @ FOWLE ST	0		0.3		9.7	.		.		.	0		2		12	.	
20000 - 9122 - MAIN ST @ GREEN ST	0		0.7		9	.		.		.	2		2		12	.	
20400 - 9123 - 275 MAIN ST	0		0.7		8.3	.		.		.	0		0		12	.	
20800 - 9124 - MAIN ST @ MONTVALE AVE	0		2		6.3	.		.		.	1		2		11	.	
21200 - 9127 - MAIN ST @ EVERETT ST	0		0.7		5.7	.		.		.	1		3		9	.	
21600 - 9128 - MAIN ST @ MANNING ST	0		0		5.7	.		.		.	0		2		7	.	
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0		5.7	.		.		.	0		0		7	.	
22400 - 9130 - MAIN ST @ PAGE PL	0		0		5.7	.		.		.	0		0		7	.	
22800 - 9131 - MAIN ST @ EATON AVE	0		0		5.7	.		.		.	0		0		7	.	
23200 - 9133 - MAIN ST @ FISHER TERR	0		1		4.7	.		.		.	0		0		7	.	
24000 - 9134 - ELM ST @ MONUMENT	0		0.7		4	.		.		.	0		4		3	.	
24400 - 9135 - 31 ELM ST	0		0		4	.		.		.	0		0		3	.	
24800 - 9136 - 53 ELM ST	0		0		4	.		.		.	0		0		3	.	
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0		4	.		.		.	0		0		3	.	
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0		4	.		.		.	0		0		3	.	
26400 - 9140 - 949 MAIN ST	0		0		4	.		.		.	0		0		3	.	
26800 - 9142 - 979 MAIN ST	0		0		4	.		.		.	0		0		3	.	
27200 - 9143 - MAIN ST @ WHEELING AVE	0		1		3	.		.		.	0		0		3	.	
27600 - 9144 - 1075 MAIN ST	0		0.7		2.3	.		.		.	0		0		3	.	
28000 - 8852 - MAIN ST @ N MAPLE ST	0		2.3		0	.		.		.	0		3		0	.	
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.		.		.	.		.		.	.		.		.	.	
Maximum					15.7					4					18		
Total	17.3		17.3			4		4			16.5		25			5	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	4.6) [1] !Fall 2012!			08:10 (134.5) [2] !Fall 2012!					08:40 (134.6) [1] !Fall 2012!					09:10 (134.5) [1] !Fall 2012!			
	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	0		4	15	1	0		15	5	1	0		6	21	3	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		4.5	0		0		15	0.5		0.5		6	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0		8	0		0		15	0		0		10	0		0	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		8	0		0		15	0		0		10	0		0	
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	1		7	0		1		14	0		0		10	0		1	
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		7	0		0		14	0		0		10	0		0	
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		7	0		0		14	0		0		10	0		0	
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		7	0		0		14	0		0		10	0		0	
3600 - 49157 - 61 LOCUST ST	0		7	0		0		14	0		0		10	0		0	
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	3		4	1		1		14	1		7		4	0		8	
4400 - 9165 - 350 RIVERSIDE AVE	2		2	0.5		0		14.5	0		0		4	0		0	
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		3	0.5		0		15	1		0		5	0		1	
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		3	0.5		0		15.5	0		0		5	0		0	
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		3	0		0		15.5	0		0		5	0		0	
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		3	0.5		0		16	0		0		5	0		0	
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		3	0		0		16	0		0		5	0		0	
6800 - 9172 - 116 RIVERSIDE AVE	0		3	0		0.5		15.5	0		0		5	0		0	
7200 - 5002 - SALEM ST OPP RIVER ST	2		1	3.5		2		17	0		4		1	1		0	
7600 - 15002 - HIGH ST @ BRADLEE RD	0		1	0		0		17	0		0		1	1		0	
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		1	0		0.5		16.5	0		0		1	1		0	
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		1	0		0		16.5	0		0		1	0		0	
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		1	0		0		16.5	0		0		1	0		0	
9200 - 5006 - 305 WINTHROP ST	0		1	0		0		16.5	0		0		1	0		0	
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		1	0		0		16.5	0		0		1	0		0	
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		1	0		0		16.5	0		0		1	0		0	
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		1	0		0		16.5	0		0		1	0		0	
10800 - 9177 - WINTHROP ST @ MEDFORD HS	1		0	0		1		15.5	0		0		1	0		0	
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0	0		0		15.5	0		0		1	0		0	
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0	0.5		0		16	0		0		1	0		0	
12000 - 9101 - WINTHROP ST @ WINFORD WAY	.		.	0		0		16	.		.		.	0		1	
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	.		.	0		0		16	.		.		.	0		0	
12800 - 9103 - MAIN ST @ TOWN WAY	.		.	0		0		16	.		.		.	0		0	
13200 - 9104 - MAIN ST @ HIGHLAND AVE	.		.	0		0		16	.		.		.	0		0	
13600 - 9105 - MAIN ST @ EVERELL RD	.		.	0		1		15	.		.		.	0		0	
14000 - 9106 - MAIN ST @ MARSHALL RD	.		.	0		0		15	.		.		.	0		0	
14400 - 9107 - MAIN ST @ CHESTNUT ST	.		.	0		0.5		14.5	.		.		.	0		0	
14800 - 9108 - MAIN ST @ PROSPECT ST	.		.	0		0.5		14	.		.		.	0		0	
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	.		.	0		0		14	.		.		.	0		0	
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	.		.	0.5		0.5		14	.		.		.	0		2	
16000 - 9111 - MAIN ST @ VINE ST	.		.	0		0		14	.		.		.	0		0	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	4.6) [1] !Fall 2012!			08:10 (134.5) [2] !Fall 2012!					08:40 (134.6) [1] !Fall 2012!					09:10 (134.5) [1] !Fall 2012!			
Seq - StopID - Stop Name	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
16400 - 9113 - MAIN ST @ LAKE ST	.		.	0		1		13	.		.		.	0		0	
16800 - 9114 - 757 MAIN ST	.		.	0		1		12	.		.		.	0		2	
17200 - 9115 - MAIN ST OPP RICHARDSON ST	.		.	0		1		11	.		.		.	0		0	
17600 - 9116 - 955 MAIN ST	.		.	0		0		11	.		.		.	0		2	
18000 - 9117 - 995 MAIN ST	.		.	0		0.5		10.5	.		.		.	0		0	
18400 - 9118 - MAIN ST @ CRANES CT	.		.	0		0		10.5	.		.		.	0		0	
18800 - 9119 - MAIN ST @ VINING CT	.		.	0		0		10.5	.		.		.	0		1	
19200 - 9120 - MAIN ST @ RICHARDSON ST	.		.	0		0		10.5	.		.		.	0		0	
19600 - 9121 - MAIN ST @ FOWLE ST	.		.	0		0		10.5	.		.		.	0		0	
20000 - 9122 - MAIN ST @ GREEN ST	.		.	0		0		10.5	.		.		.	0		0	
20400 - 9123 - 275 MAIN ST	.		.	0		0.5		10	.		.		.	0		0	
20800 - 9124 - MAIN ST @ MONTVALE AVE	.		.	0		1		9	.		.		.	0		0	
21200 - 9127 - MAIN ST @ EVERETT ST	.		.	0.5		2		7.5	.		.		.	0		2	
21600 - 9128 - MAIN ST @ MANNING ST	.		.	0		0		7.5	.		.		.	0		0	
22000 - 9129 - MAIN ST @ MISHAWUM RD	.		.	0		0.5		7	.		.		.	0		0	
22400 - 9130 - MAIN ST @ PAGE PL	.		.	0		0		7	.		.		.	0		0	
22800 - 9131 - MAIN ST @ EATON AVE	.		.	0		0.5		6.5	.		.		.	0		0	
23200 - 9133 - MAIN ST @ FISHER TERR	.		.	0		0.5		6	.		.		.	0		0	
24000 - 9134 - ELM ST @ MONUMENT	.		.	0		2		4	.		.		.	0		1	
24400 - 9135 - 31 ELM ST	.		.	0		0		4	.		.		.	0		0	
24800 - 9136 - 53 ELM ST	.		.	0		0		4	.		.		.	0		1	
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	.		.	0		0		4	.		.		.	0		1	
26000 - 9139 - MAIN ST @ NICHOLS ST E	.		.	0		0.5		3.5	.		.		.	0		0	
26400 - 9140 - 949 MAIN ST	.		.	0		0		3.5	.		.		.	0		0	
26800 - 9142 - 979 MAIN ST	.		.	0		0		3.5	.		.		.	0		0	
27200 - 9143 - MAIN ST @ WHEELING AVE	.		.	0		0		3.5	.		.		.	0		0	
27600 - 9144 - 1075 MAIN ST	.		.	0		1		2.5	.		.		.	0		0	
28000 - 8852 - MAIN ST @ N MAPLE ST	.		.	0		2.5		0	.		.		.	0		1	
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.		.	.		.		.	.		.		.	.		.	
Maximum			8					17					10				
Total	9			23		23			7.5		11.5			24		24	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

		09:40 (134.6) [1] !Fall 2012!					10:10 (134.5) [2] !Fall 2012!					10:40 (134.6) [2] !Fall 2012!					
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On
400 - 5271 - WELLINGTON STATION BUSWAY	21	0	2	0		0	19	3	0		19	9.5	2	0		9.5	21.3
800 - 9318 - CORPORATION WAY AFTER BRIDGE	21	5		0		5	0		0		19	0		0		9.5	0
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	21	0		0		5	0		0.5		18.5	0		0		9.5	0
1600 - 9045 - FELLSWAY @ BRADBURY AVE	21	0		0		5	0		0		18.5	0		0		9.5	0.3
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	20	1		0		6	1		0		19.5	0.5		1		9	0.3
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	20	0		0		6	0		0		19.5	0		0		9	0
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	20	0		0		6	0		0		19.5	0		0		9	0
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	20	1		0		7	0		0.5		19	0		0		9	0
3600 - 49157 - 61 LOCUST ST	20	1		1		7	0.5		1		18.5	0.5		2		7.5	0.7
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	12	1		4		4	1		9		10.5	1		4		4.5	1.3
4400 - 9165 - 350 RIVERSIDE AVE	12	0		0		4	0		0		10.5	0		0		4.5	0.3
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	11	0		0		4	0		0		10.5	0.5		0		5	0
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	11	0		0		4	0.5		0		11	0		0		5	0
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	11	0		0		4	0.5		0		11.5	0		0		5	0.3
6000 - 9170 - RIVERSIDE AVE @ PARK ST	11	0		0		4	1.5		0		13	0		0		5	0
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	11	0		0		4	0		0		13	0		0		5	0
6800 - 9172 - 116 RIVERSIDE AVE	11	0		1		3	0		0.5		12.5	0		0		5	0
7200 - 5002 - SALEM ST OPP RIVER ST	12	0		1		2	0.5		2		11	0		3		2	1.3
7600 - 15002 - HIGH ST @ BRADLEE RD	13	0		0		2	1.5		0.5		12	0		0		2	0.3
8000 - 5003 - HIGH ST @ HILLSIDE AVE	14	0		0		2	0		0.5		11.5	0		0.5		1.5	0
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	14	0		0		2	0		0		11.5	0		0		1.5	0
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	14	0		0		2	0		1		10.5	0		0		1.5	0.3
9200 - 5006 - 305 WINTHROP ST	14	0		0		2	0		0		10.5	0		0		1.5	0
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	14	0		0		2	0		0.5		10	0		0		1.5	0
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	14	0		0		2	0		0		10	0		0		1.5	0
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	14	0		0		2	0		0		10	0		0		1.5	0
10800 - 9177 - WINTHROP ST @ MEDFORD HS	14	0		0		2	0		1		9	0		0.5		1	0
11200 - 9178 - WINTHROP ST OPP SMITH LN	14	0		0		2	0		0		9	0		0		1	0
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	14	0		2		0	0.5		0		9.5	0		1		0	0.7
12000 - 9101 - WINTHROP ST @ WINFORD WAY	13	.		.		.	0		0		9.5	.		.		.	0
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	13	.		.		.	0		0		9.5	.		.		.	0
12800 - 9103 - MAIN ST @ TOWN WAY	13	.		.		.	0		0		9.5	.		.		.	0
13200 - 9104 - MAIN ST @ HIGHLAND AVE	13	.		.		.	0		0		9.5	.		.		.	0
13600 - 9105 - MAIN ST @ EVERELL RD	13	.		.		.	0		0		9.5	.		.		.	0
14000 - 9106 - MAIN ST @ MARSHALL RD	13	.		.		.	0		0		9.5	.		.		.	0
14400 - 9107 - MAIN ST @ CHESTNUT ST	13	.		.		.	0		0		9.5	.		.		.	0
14800 - 9108 - MAIN ST @ PROSPECT ST	13	.		.		.	0		0		9.5	.		.		.	0
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	13	.		.		.	0		0		9.5	.		.		.	0
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	11	.		.		.	0		3.5		6	.		.		.	0
16000 - 9111 - MAIN ST @ VINE ST	11	.		.		.	0		0		6	.		.		.	0

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name		09:40 (134.6) [1] !Fall 2012!					10:10 (134.5) [2] !Fall 2012!					10:40 (134.6) [2] !Fall 2012!					
	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On
16400 - 9113 - MAIN ST @ LAKE ST	11	.		.		.	0		0		6	.		.		.	1.3
16800 - 9114 - 757 MAIN ST	9	.		.		.	0		0		6	.		.		.	1
17200 - 9115 - MAIN ST OPP RICHARDSON ST	9	.		.		.	0		0		6	.		.		.	0
17600 - 9116 - 955 MAIN ST	7	.		.		.	0		0		6	.		.		.	0.7
18000 - 9117 - 995 MAIN ST	7	.		.		.	0		0		6	.		.		.	0
18400 - 9118 - MAIN ST @ CRANES CT	7	.		.		.	0		0		6	.		.		.	0.3
18800 - 9119 - MAIN ST @ VINING CT	6	.		.		.	0		0		6	.		.		.	0
19200 - 9120 - MAIN ST @ RICHARDSON ST	6	.		.		.	0		0		6	.		.		.	0
19600 - 9121 - MAIN ST @ FOWLE ST	6	.		.		.	0		0.5		5.5	.		.		.	0
20000 - 9122 - MAIN ST @ GREEN ST	6	.		.		.	0		1		4.5	.		.		.	0
20400 - 9123 - 275 MAIN ST	6	.		.		.	0		0.5		4	.		.		.	0
20800 - 9124 - MAIN ST @ MONTVALE AVE	6	.		.		.	0		1		3	.		.		.	0
21200 - 9127 - MAIN ST @ EVERETT ST	4	.		.		.	0		0.5		2.5	.		.		.	0.7
21600 - 9128 - MAIN ST @ MANNING ST	4	.		.		.	0		0		2.5	.		.		.	0
22000 - 9129 - MAIN ST @ MISHAWUM RD	4	.		.		.	0		0		2.5	.		.		.	0
22400 - 9130 - MAIN ST @ PAGE PL	4	.		.		.	0		0		2.5	.		.		.	0
22800 - 9131 - MAIN ST @ EATON AVE	4	.		.		.	0		1		1.5	.		.		.	0
23200 - 9133 - MAIN ST @ FISHER TERR	4	.		.		.	0		0		1.5	.		.		.	0
24000 - 9134 - ELM ST @ MONUMENT	3	.		.		.	0		1.5		0	.		.		.	1
24400 - 9135 - 31 ELM ST	3	.		.		.	0		0		0	.		.		.	0
24800 - 9136 - 53 ELM ST	2	.		.		.	0		0		0	.		.		.	0
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	1	.		.		.	0		0		0	.		.		.	0
26000 - 9139 - MAIN ST @ NICHOLS ST E	1	.		.		.	0		0		0	.		.		.	0
26400 - 9140 - 949 MAIN ST	1	.		.		.	0		0		0	.		.		.	0
26800 - 9142 - 979 MAIN ST	1	.		.		.	0		0		0	.		.		.	0
27200 - 9143 - MAIN ST @ WHEELING AVE	1	.		.		.	0		0		0	.		.		.	0
27600 - 9144 - 1075 MAIN ST	1	.		.		.	0		0		0	.		.		.	0
28000 - 8852 - MAIN ST @ N MAPLE ST	0	.		.		.	0		0		0	.		.		.	0
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.	.		.		.	.		.		.	.		.		.	.
Maximum	21					7					19.5					9.5	
Total		9		9			26.5		26.5			12		12			32.3

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:10 (134.5) [3] !Spring 2013!				11:40 (134.6) [1] !Fall 2012!					12:10 (134.5) [2] !Fall 2012!					12:40 (134.6) [3] !I		
Seq - StopID - Stop Name	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off
400 - 5271 - WELLINGTON STATION BUSWAY	2	0		21.3	13	2	0		13	26.5	3	0		26.5	10.6	2	0
800 - 9318 - CORPORATION WAY AFTER BRIDGE		0		21.3	0		0		13	0		0		26.5	0.8		0.4
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE		0.3		21	0		0		13	0		0		26.5	0.7		0.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE		0		21.3	0		0		13	0		0		26.5	0		0
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY		0		21.7	0		0		13	4.5		1		30	1		0.3
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL		0		21.7	0		0		13	0		0.5		29.5	0		0
2800 - 9164 - RIVERSIDE AVE OPP HALL ST		0.3		21.3	0		0		13	0.5		0		30	0		0
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN		0		21.3	0		0		13	0		0		30	0		0
3600 - 49157 - 61 LOCUST ST		2.3		19.7	0		1		12	3		1		32	0.7		2.7
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA		5.7		15.3	5		13		5	5.5		12		25.5	2		9.7
4400 - 9165 - 350 RIVERSIDE AVE		0.7		15	0		0		5	0.5		0.5		25.5	0		0
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE		0		15	0		0		5	0		4.5		21	0		0
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST		0		15	2		0		7	0		0		21	0		0
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST		1		14.3	0		0		7	0		0.5		20.5	0		0.3
6000 - 9170 - RIVERSIDE AVE @ PARK ST		0.3		14	0		0		7	0		1.5		19	0		1.3
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST		0.3		13.7	0		0		7	0		0		19	0		0
6800 - 9172 - 116 RIVERSIDE AVE		0.3		13.3	0		0		7	0		1.5		17.5	0		1.3
7200 - 5002 - SALEM ST OPP RIVER ST		1.3		13.3	0		4		3	0		3		14.5	0.3		2
7600 - 15002 - HIGH ST @ BRADLEE RD		0.7		13	0		0		3	0		0.5		14	0		0.7
8000 - 5003 - HIGH ST @ HILLSIDE AVE		0		13	0		0		3	0		0.5		13.5	0		0.3
8400 - 5004 - HIGH ST @ POWDER HOUSE RD		0		13	0		0		3	0		1		12.5	0		0.3
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO		0		13.3	0		0		3	1		0.5		13	0		0
9200 - 5006 - 305 WINTHROP ST		0		13.3	0		0		3	0		0		13	0		0
9600 - 9174 - WINTHROP ST @ LAWRENCE RD		0		13.3	0		0		3	0		0.5		12.5	0		0.7
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE		0		13.3	0		0		3	0		0		12.5	0		0
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL		0		13.3	0		0		3	0		0		12.5	0		0
10800 - 9177 - WINTHROP ST @ MEDFORD HS		0		13.3	0		0		3	0		0		12.5	0		0
11200 - 9178 - WINTHROP ST OPP SMITH LN		0		13.3	0		0		3	0		0		12.5	0		0
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD		0		14	0		2		1	0		0		12.5	0		2.7
12000 - 9101 - WINTHROP ST @ WINFORD WAY		0		14	.		.		.	0		0		12.5	.		.
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON		0		14	.		.		.	0.5		0		13	.		.
12800 - 9103 - MAIN ST @ TOWN WAY		0		14	.		.		.	0		0		13	.		.
13200 - 9104 - MAIN ST @ HIGHLAND AVE		0		14	.	.	.		.	0		0		13	.		.
13600 - 9105 - MAIN ST @ EVERELL RD		0		14	.		.		.	0		0		13	.		.
14000 - 9106 - MAIN ST @ MARSHALL RD		0		14	.		.		.	0		0		13	.		.
14400 - 9107 - MAIN ST @ CHESTNUT ST		0		14	.		.		.	0		0		13	.		.
14800 - 9108 - MAIN ST @ PROSPECT ST		0		14	.		.		.	0		0		13	.		.
15200 - 9109 - MAIN ST @ FAIRVIEW TERR		0		14	.		.		.	0		0		13	.		.
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR		0.3		13.7	.		.		.	0		1		12	.		.
16000 - 9111 - MAIN ST @ VINE ST		0.3		13.3	.		.		.	0		1		11	.		.

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	11:10 (134.5) [3] !Spring 2013!				11:40 (134.6) [1] !Fall 2012!					12:10 (134.5) [2] !Fall 2012!					12:40 (134.6) [3] !I		
Seq - StopID - Stop Name	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off
16400 - 9113 - MAIN ST @ LAKE ST		0.3		14.3	.		.		.	0		1		10	.		.
16800 - 9114 - 757 MAIN ST		0		15.3	.		.		.	0		0		10	.		.
17200 - 9115 - MAIN ST OPP RICHARDSON ST		2		13.3	.		.		.	2		0.5		11.5	.		.
17600 - 9116 - 955 MAIN ST		0.3		13.7	.		.		.	0		1.5		10	.		.
18000 - 9117 - 995 MAIN ST		0		13.7	.		.		.	0		0		10	.		.
18400 - 9118 - MAIN ST @ CRANES CT		2.3		11.7	.		.		.	0		0		10	.		.
18800 - 9119 - MAIN ST @ VINING CT		0.7		11	.		.		.	0		0		10	.		.
19200 - 9120 - MAIN ST @ RICHARDSON ST		0		11	.		.		.	0		0.5		9.5	.		.
19600 - 9121 - MAIN ST @ FOWLE ST		0		11	.		.		.	0.5		1		9	.		.
20000 - 9122 - MAIN ST @ GREEN ST		1		10	.		.		.	0		1		8	.		.
20400 - 9123 - 275 MAIN ST		0		10	.		.		.	0.5		1		7.5	.		.
20800 - 9124 - MAIN ST @ MONTVALE AVE		1.7		8.3	.		.		.	0		5		2.5	.		.
21200 - 9127 - MAIN ST @ EVERETT ST		3.3		5.7	.		.		.	0.5		1.5		1.5	.		.
21600 - 9128 - MAIN ST @ MANNING ST		0		5.7	.		.		.	0.5		0.5		1.5	.		.
22000 - 9129 - MAIN ST @ MISHAWUM RD		0		5.7	.		.		.	0		0		1.5	.		.
22400 - 9130 - MAIN ST @ PAGE PL		0		5.7	.		.		.	0		0		1.5	.		.
22800 - 9131 - MAIN ST @ EATON AVE		0		5.7	.		.		.	0		0		1.5	.		.
23200 - 9133 - MAIN ST @ FISHER TERR		0.7		5	.		.		.	0		0.5		1	.		.
24000 - 9134 - ELM ST @ MONUMENT		1.3		4.7	.		.		.	0		1		0	.		.
24400 - 9135 - 31 ELM ST		0		4.7	.		.		.	0		0		0	.		.
24800 - 9136 - 53 ELM ST		0		4.7	.		.		.	0		0		0	.		.
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST		0.7		4	.		.		.	0		0		0	.		.
26000 - 9139 - MAIN ST @ NICHOLS ST E		1.7		2.3	.		.		.	0		0		0	.		.
26400 - 9140 - 949 MAIN ST		0		2.3	.		.		.	0		0		0	.		.
26800 - 9142 - 979 MAIN ST		0		2.3	.		.		.	0		0		0	.		.
27200 - 9143 - MAIN ST @ WHEELING AVE		0		2.3	.		.		.	0		0		0	.		.
27600 - 9144 - 1075 MAIN ST		0		2.3	.		.		.	0		0		0	.		.
28000 - 8852 - MAIN ST @ N MAPLE ST		1.3		1	.		.		.	0		0		0	.		.
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN		.		.	.		.		.	.		.		.	.		.
Maximum				21.7					13					32			
Total		31.3			20		20			46		46			16.1		23.4

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

			Trip (RouteVar) [Observations]														
	all 2012!		13:10 (134.5) [3] !Fall 2012!					13:40 (134.6) [1] !Fall 2012!					14:10 (134.5) [3] !Fall 2012!				
Seq - StopID - Stop Name	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY		11.8	27	2	0		27	12	2	0		12	19	2	0		19
800 - 9318 - CORPORATION WAY AFTER BRIDGE		12.2	0		0		27	0		0		12	1		0		20
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE		18.3	0.3		0.7		26.7	0		0		12	0.3		0.3		26.7
1600 - 9045 - FELLSWAY @ BRADBURY AVE		18.3	0		0.3		26.3	1		1		12	0.3		1.3		25.7
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY		19	1		0		27.3	0		0		12	1.3		1.3		25.7
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL		19	0.3		0.3		27.3	0		0		12	0.3		0.3		25.7
2800 - 9164 - RIVERSIDE AVE OPP HALL ST		19	0		0		27.3	0		0		12	0		0		25.7
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN		19	0		0		27.3	0		1		11	0		0.3		25.3
3600 - 49157 - 61 LOCUST ST		17	0.3		4.7		23	1		0		12	1		2.3		24
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA		9.3	5		7.7		20.3	3		9		6	4.3		8.7		19.7
4400 - 9165 - 350 RIVERSIDE AVE		9.3	0		0		20.3	0		0		6	0.7		1		19.3
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE		9.3	0.3		1.7		19	0		0		6	0.3		0		19.7
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST		9.3	0		0		19	0		0		6	0		0.3		19.3
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST		9	0		0		19	0		0		6	0		0		19.3
6000 - 9170 - RIVERSIDE AVE @ PARK ST		7.7	0		0.3		18.7	0		0		6	0		0.3		19
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST		7.7	0		0		18.7	0		1		5	0		0		19
6800 - 9172 - 116 RIVERSIDE AVE		6.3	0		0		18.7	0		1		4	0.3		1.3		18
7200 - 5002 - SALEM ST OPP RIVER ST		4.7	1		1.7		18	0		0		4	0.7		1.3		17.3
7600 - 15002 - HIGH ST @ BRADLEE RD		4	0		0		18	0		0		4	0.3		0.7		17
8000 - 5003 - HIGH ST @ HILLSIDE AVE		3.7	0		0		18	0		0		4	1.3		0.3		18
8400 - 5004 - HIGH ST @ POWDER HOUSE RD		3.3	0		0.3		17.7	0		0		4	0		0.3		17.7
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO		3.3	0		0		17.7	1		1		4	1.3		1.3		17.7
9200 - 5006 - 305 WINTHROP ST		3.3	0		0		17.7	0		0		4	0		0		17.7
9600 - 9174 - WINTHROP ST @ LAWRENCE RD		2.7	0.3		0		18	0		0		4	0		1		16.7
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE		2.7	0		0		18	0		0		4	0		0		16.7
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL		2.7	0		0		18	0		0		4	0		0		16.7
10800 - 9177 - WINTHROP ST @ MEDFORD HS		2.7	0		0		18	0		2		2	0		0		16.7
11200 - 9178 - WINTHROP ST OPP SMITH LN		2.7	0		0		18	0		0		2	0		0		16.7
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD		0	0		0		18	0		1		1	0.3		0		17
12000 - 9101 - WINTHROP ST @ WINFORD WAY		.	0		0		18	.		.		.	0		0.3		16.7
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON		.	0		0		18	.		.		.	0		0		16.7
12800 - 9103 - MAIN ST @ TOWN WAY		.	0		0		18	.		.		.	0		0		16.7
13200 - 9104 - MAIN ST @ HIGHLAND AVE		.	0		0		18	.		.		.	0		0		16.7
13600 - 9105 - MAIN ST @ EVERELL RD		.	0		0		18	.		.		.	0		0		16.7
14000 - 9106 - MAIN ST @ MARSHALL RD		.	0		0		18	.		.		.	0		0		16.7
14400 - 9107 - MAIN ST @ CHESTNUT ST		.	0		0		18	.		.		.	0		0		16.7
14800 - 9108 - MAIN ST @ PROSPECT ST		.	0		0		18	.		.		.	0		0		16.7
15200 - 9109 - MAIN ST @ FAIRVIEW TERR		.	0		0		18	.		.		.	0		0		16.7
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR		.	0.7		0.3		18.3	.		.		.	0.7		3		14.3
16000 - 9111 - MAIN ST @ VINE ST		.	0		0		18.3	.		.		.	0		0.3		14

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	Trip (RouteVar) [Observations]																
	all 2012!		13:10 (134.5) [3] !Fall 2012!					13:40 (134.6) [1] !Fall 2012!					14:10 (134.5) [3] !Fall 2012!				
Seq - StopID - Stop Name	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
16400 - 9113 - MAIN ST @ LAKE ST		.	0.3		0.7		18	.		.		.	0		1.3		12.7
16800 - 9114 - 757 MAIN ST		.	0		0		18	.		.		.	0		0		12.7
17200 - 9115 - MAIN ST OPP RICHARDSON ST		.	0		1.7		16.3	.		.		.	0		0.7		12
17600 - 9116 - 955 MAIN ST		.	0		0.7		15.7	.		.		.	0		0.3		11.7
18000 - 9117 - 995 MAIN ST		.	0		0.3		15.3	.		.		.	0		0		11.7
18400 - 9118 - MAIN ST @ CRANES CT		.	0		1		14.3	.		.		.	0		0.3		11.3
18800 - 9119 - MAIN ST @ VINING CT		.	0.3		0.3		14.3	.		.		.	0.3		0		11.7
19200 - 9120 - MAIN ST @ RICHARDSON ST		.	0		0		14.3	.		.		.	0		0		11.7
19600 - 9121 - MAIN ST @ FOWLE ST		.	0		0.7		13.7	.		.		.	0		0		11.7
20000 - 9122 - MAIN ST @ GREEN ST		.	0		1		12.7	.		.		.	0		0.7		11
20400 - 9123 - 275 MAIN ST		.	0		0		12.7	.		.		.	0		0		11
20800 - 9124 - MAIN ST @ MONTVALE AVE		.	0.3		2.7		10.3	.		.		.	0		2.7		8.3
21200 - 9127 - MAIN ST @ EVERETT ST		.	1.7		3.7		8.3	.		.		.	0		1.3		7
21600 - 9128 - MAIN ST @ MANNING ST		.	0		0		8.3	.		.		.	0		0		7
22000 - 9129 - MAIN ST @ MISHAWUM RD		.	0		1.3		7	.		.		.	0		0		7
22400 - 9130 - MAIN ST @ PAGE PL		.	0		0		7	.		.		.	0		0.3		6.7
22800 - 9131 - MAIN ST @ EATON AVE		.	0		0		7	.		.		.	0		0		6.7
23200 - 9133 - MAIN ST @ FISHER TERR		.	0		0.7		6.3	.		.		.	0		0		6.7
24000 - 9134 - ELM ST @ MONUMENT		.	0		3.7		2.7	.		.		.	0.3		2.3		4.7
24400 - 9135 - 31 ELM ST		.	0		0.3		2.3	.		.		.	0		0		4.7
24800 - 9136 - 53 ELM ST		.	0		0		2.3	.		.		.	0		0		4.7
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST		.	0		0		2.3	.		.		.	0.3		0.3		4.7
26000 - 9139 - MAIN ST @ NICHOLS ST E		.	0		0.3		2	.		.		.	0		2.3		2.3
26400 - 9140 - 949 MAIN ST		.	0		0.7		1.3	.		.		.	0		0.3		2
26800 - 9142 - 979 MAIN ST		.	0		0		1.3	.		.		.	0		0		2
27200 - 9143 - MAIN ST @ WHEELING AVE		.	0		0		1.3	.		.		.	0		0		2
27600 - 9144 - 1075 MAIN ST		.	0		0		1.3	.		.		.	0		0		2
28000 - 8852 - MAIN ST @ N MAPLE ST		.	0		1.3		0	.		.		.	0		1.7		0.3
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN		.	.		.		.	.		.		.	.		.		.
Maximum		19					27.3					12					26.7
Total			39		39			18		17			34.7		41		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	14:40 (134.6) [2] !Fall 2012!					15:10 (134.5) [1] !Fall 2012!					15:40 (134.6) [4] !Fall 2012!					16:10 (1:	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
400 - 5271 - WELLINGTON STATION BUSWAY	20.5	2	0		20.5	9	2	0		10	13.2	2	0		13.6	29	2
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		20.5	1		1		10	0		0.2		13.4	0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.5		0		21	1		0		19	0		0		16.3	2	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0.5		20.5	4		0		23	0.3		0.3		16.3	0	
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.5		0.5		20.5	1		0		24	1.3		0.3		17.3	1	
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0		20.5	0		0		24	0.3		0		17.5	0	
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		20.5	0		0		24	0		0		17.5	0	
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0		20.5	0		0		24	0		0		17.5	0	
3600 - 49157 - 61 LOCUST ST	0		1		19.5	0		4		20	1.5		3.8		15.3	1	
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	2.5		17		5	6		2		24	1.8		6.8		10.3	3	
4400 - 9165 - 350 RIVERSIDE AVE	0.5		0		5.5	0		0		24	0.3		0.5		10	0	
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		0.5		5	3		0		27	0		0		10	0	
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0		5	1		0		28	0		0.3		9.8	0	
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0		5	0		0		28	0.5		1.5		8.8	0	
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0.5		4.5	0		1		27	0.5		0		9.3	0	
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		1		3.5	0		0		27	0		0		9.3	0	
6800 - 9172 - 116 RIVERSIDE AVE	0		0		3.5	0		1		26	0		0.8		8.5	0	
7200 - 5002 - SALEM ST OPP RIVER ST	0		1		2.5	2		4		24	0		2.5		6	0	
7600 - 15002 - HIGH ST @ BRADLEE RD	0		0		2.5	0		0		24	0		2		4	0	
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0.5		2	0		1		23	0		0		4	0	
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0		2	0		0		23	0		0.5		3.5	1	
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		1		1	0		0		23	0		0		3.5	0	
9200 - 5006 - 305 WINTHROP ST	0		0		1	0		0		23	0		0		3.5	0	
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		1	0		0		23	0		0		3.5	0	
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0.5		0.5		1	0		0		23	0		0		3.5	0	
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0		1	0		0		23	0		0.3		3.3	0	
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0.5		0.5	0		0		23	0		1.3		2	0	
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		0.5	0		0		23	0		0		2	0	
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		0.5	1		0		24	0		2		0	0	
12000 - 9101 - WINTHROP ST @ WINFORD WAY	.		.		.	0		0		24	.		.		.	0	
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	.		.		.	0		0		24	.		.		.	0	
12800 - 9103 - MAIN ST @ TOWN WAY	.		.		.	0		1		23	.		.		.	0	
13200 - 9104 - MAIN ST @ HIGHLAND AVE	.		.		.	0		0		23	.		.		.	0	
13600 - 9105 - MAIN ST @ EVERELL RD	.		.		.	0		0		23	.		.		.	0	
14000 - 9106 - MAIN ST @ MARSHALL RD	.		.		.	0		0		23	.		.		.	0	
14400 - 9107 - MAIN ST @ CHESTNUT ST	.		.		.	0		0		23	.		.		.	0	
14800 - 9108 - MAIN ST @ PROSPECT ST	.		.		.	0		0		23	.		.		.	0	
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	.		.		.	0		0		23	.		.		.	0	
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	.		.		.	4		2		25	.		.		.	0	
16000 - 9111 - MAIN ST @ VINE ST	.		.		.	0		0		25	.		.		.	0	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
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	14:40 (134.6) [2] !Fall 2012!					15:10 (134.5) [1] !Fall 2012!					15:40 (134.6) [4] !Fall 2012!					16:10 (1:	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
16400 - 9113 - MAIN ST @ LAKE ST	.		.		.	0		3		22	.		.		.	0	
16800 - 9114 - 757 MAIN ST	.		.		.	0		0		22	.		.		.	1	
17200 - 9115 - MAIN ST OPP RICHARDSON ST	.		.		.	0		2		20	.		.		.	0	
17600 - 9116 - 955 MAIN ST	.		.		.	0		0		20	.		.		.	0	
18000 - 9117 - 995 MAIN ST	.		.		.	0		0		20	.		.		.	0	
18400 - 9118 - MAIN ST @ CRANES CT	.		.		.	0		0		20	.		.		.	0	
18800 - 9119 - MAIN ST @ VINING CT	.		.		.	0		1		19	.		.		.	0	
19200 - 9120 - MAIN ST @ RICHARDSON ST	.		.		.	0		0		19	.		.		.	0	
19600 - 9121 - MAIN ST @ FOWLE ST	.		.		.	0		1		18	.		.		.	0	
20000 - 9122 - MAIN ST @ GREEN ST	.		.		.	0		0		18	.		.		.	0	
20400 - 9123 - 275 MAIN ST	.		.		.	0		0		18	.		.		.	0	
20800 - 9124 - MAIN ST @ MONTVALE AVE	.		.		.	1		7		12	.		.		.	0	
21200 - 9127 - MAIN ST @ EVERETT ST	.		.		.	3		3		12	.		.		.	0	
21600 - 9128 - MAIN ST @ MANNING ST	.		.		.	0		0		12	.		.		.	0	
22000 - 9129 - MAIN ST @ MISHAWUM RD	.		.		.	0		0		12	.		.		.	0	
22400 - 9130 - MAIN ST @ PAGE PL	.		.		.	0		0		12	.		.		.	0	
22800 - 9131 - MAIN ST @ EATON AVE	.		.		.	0		1		11	.		.		.	0	
23200 - 9133 - MAIN ST @ FISHER TERR	.		.		.	0		0		11	.		.		.	0	
24000 - 9134 - ELM ST @ MONUMENT	.		.		.	1		2		10	.		.		.	0	
24400 - 9135 - 31 ELM ST	.		.		.	0		0		10	.		.		.	0	
24800 - 9136 - 53 ELM ST	.		.		.	0		0		10	.		.		.	0	
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	.		.		.	0		2		8	.		.		.	0	
26000 - 9139 - MAIN ST @ NICHOLS ST E	.		.		.	0		0		8	.		.		.	0	
26400 - 9140 - 949 MAIN ST	.		.		.	0		5		3	.		.		.	0	
26800 - 9142 - 979 MAIN ST	.		.		.	0		2		1	.		.		.	0	
27200 - 9143 - MAIN ST @ WHEELING AVE	.		.		.	0		0		1	.		.		.	0	
27600 - 9144 - 1075 MAIN ST	.		.		.	0		0		1	.		.		.	0	
28000 - 8852 - MAIN ST @ N MAPLE ST	.		.		.	0		1		0	.		.		.	0	
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.		.		.	.		.		.	.		.		.	.	
Maximum					21					28					17.5		
Total	25		24.5			38		47			19.5		22.7			38	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

Seq - StopID - Stop Name	4.5) [1] !Fall 2012!			16:40 (134.6) [3] !Fall 2012!				17:10 (134.5) [4] !Fall 2012!					17:40 (134.6) [1] !Fall 2012!				
	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
400 - 5271 - WELLINGTON STATION BUSWAY	0		29	10.3	2	0	11	13.2	1	0		13.2	25	2	0		25
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		29	0		0.2	10.8	0.4		0		13.6	0		0		25
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	2		29	0		0.3	20	0		1		16	0		0		25
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		29	0		0	20	0		0.3		15.8	0		0		25
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	1		29	1		0	21	2.3		0.5		17.5	0		0		25
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		29	0		0.3	20.7	0		0		17.5	0		0		25
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		29	0		0	20.7	0		0		17.5	0		0		25
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	2		27	0		0	20.7	0		0		17.5	0		0		25
3600 - 49157 - 61 LOCUST ST	0		28	0.3		5.3	15.7	2		1		18.5	0		7		18
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	12		19	2.3		7.3	10.7	3.3		3.8		18	2		12		8
4400 - 9165 - 350 RIVERSIDE AVE	0		19	0		1.3	9.3	0		0.5		17.5	0		2		6
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		19	0.3		2.3	7.3	0.3		0		17.8	0		2		4
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		19	0		0.3	7	0		0.8		17	0		0		4
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	2		17	0		0.3	6.7	0.5		0.5		17	0		0		4
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		17	0.7		0	7.3	0.5		0.3		17.3	0		0		4
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		17	0		0.3	7	0		0.3		17	0		0		4
6800 - 9172 - 116 RIVERSIDE AVE	1		16	0		1.7	5.3	0		0.3		16.8	0		0		4
7200 - 5002 - SALEM ST OPP RIVER ST	0		16	0.3		1.7	4	5		2.5		19.3	0		2		2
7600 - 15002 - HIGH ST @ BRADLEE RD	0		16	0.3		0.3	4	0		0.3		19	0		2		0
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		16	0		0.7	3.3	0		0.5		18.5	0		0		0
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		17	0		0	3.3	0.5		0		19	0		0		0
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		17	0		0	3.3	0		0.3		18.8	0		0		0
9200 - 5006 - 305 WINTHROP ST	0		17	0		0	3.3	0		0		18.8	0		0		0
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		17	0		0	3.3	0		0.3		18.5	0		0		0
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		17	0		0	3.3	0		0.5		18	0		0		0
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		17	0		0	3.3	0		0		18	0		0		0
10800 - 9177 - WINTHROP ST @ MEDFORD HS	1		16	0		0.3	3	0		0		18	0		0		0
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		16	0		0	3	0		0		18	0		0		0
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		16	0		2.3	0.7	0.5		0		18.5	0		0		0
12000 - 9101 - WINTHROP ST @ WINFORD WAY	1		15	.		.	.	0		0.3		18.3	.		.		.
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		15	.		.	.	0		0		18.3	.		.		.
12800 - 9103 - MAIN ST @ TOWN WAY	0		15	.		.	.	0		0		18.3	.		.		.
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		15	.		.	.	0		0		18.3	.		.		.
13600 - 9105 - MAIN ST @ EVERELL RD	0		15	.		.	.	0		0		18.3	.		.		.
14000 - 9106 - MAIN ST @ MARSHALL RD	0		15	.		.	.	0		0		18.3	.		.		.
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		15	.		.	.	0		0		18.3	.		.		.
14800 - 9108 - MAIN ST @ PROSPECT ST	0		15	.		.	.	0		0		18.3	.		.		.
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		15	.		.	.	0		0		18.3	.		.		.
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0		15	.		.	.	0		1.8		16.5	.		.		.
16000 - 9111 - MAIN ST @ VINE ST	0		15	.		.	.	0		0.5		16	.		.		.

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	4.5) [1] !Fall 2012!			16:40 (134.6) [3] !Fall 2012!				17:10 (134.5) [4] !Fall 2012!					17:40 (134.6) [1] !Fall 2012!				
Seq - StopID - Stop Name	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load
16400 - 9113 - MAIN ST @ LAKE ST	1		14	.			.	1.3		0.8		16.5	.		.		.
16800 - 9114 - 757 MAIN ST	2		13	.			.	0		0		16.5	.		.		.
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		13	.			.	0		3		13.5	.		.		.
17600 - 9116 - 955 MAIN ST	1		12	.			.	0		0		13.5	.		.		.
18000 - 9117 - 995 MAIN ST	0		12	.			.	0		0.5		13	.		.		.
18400 - 9118 - MAIN ST @ CRANES CT	1		11	.			.	0		0.3		12.8	.		.		.
18800 - 9119 - MAIN ST @ VINING CT	0		11	.			.	0		0.3		12.5	.		.		.
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		11	.			.	0		0		12.5	.		.		.
19600 - 9121 - MAIN ST @ FOWLE ST	0		11	.			.	0		0.8		11.8	.		.		.
20000 - 9122 - MAIN ST @ GREEN ST	0		11	.			.	0		1		10.8	.		.		.
20400 - 9123 - 275 MAIN ST	0		11	.			.	0		0		10.8	.		.		.
20800 - 9124 - MAIN ST @ MONTVALE AVE	2		9	.			.	0		1.5		9.3	.		.		.
21200 - 9127 - MAIN ST @ EVERETT ST	0		9	.			.	0.3		3.8		5.8	.		.		.
21600 - 9128 - MAIN ST @ MANNING ST	0		9	.			.	0		0		5.8	.		.		.
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		9	.			.	0		0		5.8	.		.		.
22400 - 9130 - MAIN ST @ PAGE PL	3		6	.			.	0		0.3		5.5	.		.		.
22800 - 9131 - MAIN ST @ EATON AVE	0		6	.			.	0.5		0.5		5.5	.		.		.
23200 - 9133 - MAIN ST @ FISHER TERR	0		6	.			.	0.3		0.3		5.5	.		.		.
24000 - 9134 - ELM ST @ MONUMENT	3		3	.			.	0		2.5		3	.		.		.
24400 - 9135 - 31 ELM ST	0		3	.			.	0		0		3	.		.		.
24800 - 9136 - 53 ELM ST	0		3	.			.	0		0		3	.		.		.
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		3	.			.	0.8		1.5		2.3	.		.		.
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		3	.			.	0		0		2.3	.		.		.
26400 - 9140 - 949 MAIN ST	0		3	.			.	0		0		2.3	.		.		.
26800 - 9142 - 979 MAIN ST	0		3	.			.	0		0		2.3	.		.		.
27200 - 9143 - MAIN ST @ WHEELING AVE	0		3	.			.	0		0		2.3	.		.		.
27600 - 9144 - 1075 MAIN ST	0		3	.			.	0		0		2.3	.		.		.
28000 - 8852 - MAIN ST @ N MAPLE ST	3		0	.			.	0		2.3		0	.		.		.
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.		.	.			.	.		.		.	.		.		.
Maximum			29				21					19.3					25
Total	38			15.7		25.2		31.4		34.8			27		27		

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:10 (134.5) [3] !Fall 2012!					18:40 (134.6) [1] !Fall 2012!					19:10 (134.5) [2] !Spring 2013!					20:05 (13	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
400 - 5271 - WELLINGTON STATION BUSWAY	12.7	2	0		12.7	9	2	0		9	11.7	3	0		12	9	1
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		0		12.7	0		0		9	0		0		12	0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.3		0.7		12.3	0		0		18	0		0		17.5	0.8	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		0		12.3	0		0		18	0		0		17.5	0.3	
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0.3		0.3		12.3	0		1		17	1		0		18.5	1	
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0		0		12.3	0		0		17	0		0		18.5	0	
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		0		12.3	0		0		17	0		0		18.5	0	
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		0		12.3	0		0		17	0		0		18.5	0	
3600 - 49157 - 61 LOCUST ST	1.7		1		13	0		6		11	0		3.5		15	0.3	
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	2		0.7		14.3	0		4		7	3.5		0.5		18	1.3	
4400 - 9165 - 350 RIVERSIDE AVE	0		0.3		14	0		3		4	0		0		18	0	
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	0		0.3		13.7	0		0		4	0		0.5		17.5	0.3	
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0		0		13.7	0		1		3	0		0		17.5	0	
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		0.7		13	0		0		3	0		1.5		16	0	
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		0		13	0		0		3	0		0		16	0	
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		0		13	0		0		3	0		0		16	0	
6800 - 9172 - 116 RIVERSIDE AVE	0		0		13	0		0		3	0		1		15	0	
7200 - 5002 - SALEM ST OPP RIVER ST	0		0		13	0		1		2	1.5		1		15.5	.	
7600 - 15002 - HIGH ST @ BRADLEE RD	0.3		0.3		13	0		0		2	1.5		1		16	.	
8000 - 5003 - HIGH ST @ HILLSIDE AVE	0		0.3		12.7	0		0		2	0		0		16	.	
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	0		0.3		12.3	0		0		2	0		0.5		15.5	.	
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	0		1		11.3	0		0		2	0		0		15.5	.	
9200 - 5006 - 305 WINTHROP ST	0		0		11.3	0		0		2	0		0		15.5	.	
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	0		0		11.3	0		0		2	0		0		15.5	.	
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	0		0		11.3	0		0		2	0		0		15.5	.	
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	0		0.3		11	0		0		2	0		0		15.5	.	
10800 - 9177 - WINTHROP ST @ MEDFORD HS	0		0		11	0		0		2	0		0.5		15	.	
11200 - 9178 - WINTHROP ST OPP SMITH LN	0		0		11	0		0		2	0		0		15	.	
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	0		0		11	0		0		2	0		0		15	.	
12000 - 9101 - WINTHROP ST @ WINFORD WAY	0		0.3		10.7	.		.		.	0		0		15	.	
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	0		0		10.7	.		.		.	0		0		15	.	
12800 - 9103 - MAIN ST @ TOWN WAY	0		0		10.7	.		.		.	0		0		15	.	
13200 - 9104 - MAIN ST @ HIGHLAND AVE	0		0		10.7	.		.		.	0		0		15	.	
13600 - 9105 - MAIN ST @ EVERELL RD	0		0		10.7	.		.		.	0		0		15	.	
14000 - 9106 - MAIN ST @ MARSHALL RD	0		0		10.7	.		.		.	0		0		15	.	
14400 - 9107 - MAIN ST @ CHESTNUT ST	0		0		10.7	.		.		.	0		0		15	.	
14800 - 9108 - MAIN ST @ PROSPECT ST	0		0		10.7	.		.		.	0		0		15	.	
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	0		0		10.7	.		.		.	0		0		15	.	
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	0		1		9.7	.		.		.	0		1		14	.	
16000 - 9111 - MAIN ST @ VINE ST	0		0.3		9.3	.		.		.	0		0.5		13.5	.	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	18:10 (134.5) [3] !Fall 2012!					18:40 (134.6) [1] !Fall 2012!					19:10 (134.5) [2] !Spring 2013!					20:05 (1:	
Seq - StopID - Stop Name	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn
16400 - 9113 - MAIN ST @ LAKE ST	0		0		9.3	.		.		.	0		1		12.5	.	
16800 - 9114 - 757 MAIN ST	0		0		9.3	.		.		.	0		0		12.5	.	
17200 - 9115 - MAIN ST OPP RICHARDSON ST	0		0.7		8.7	.		.		.	0		1.5		11	.	
17600 - 9116 - 955 MAIN ST	0		0		8.7	.		.		.	0		0		11	.	
18000 - 9117 - 995 MAIN ST	0		0		8.7	.		.		.	0		0		11	.	
18400 - 9118 - MAIN ST @ CRANES CT	0		0		8.7	.		.		.	0		0		11	.	
18800 - 9119 - MAIN ST @ VINING CT	0		0.3		8.3	.		.		.	0		1		10	.	
19200 - 9120 - MAIN ST @ RICHARDSON ST	0		0		8.3	.		.		.	0		0		10	.	
19600 - 9121 - MAIN ST @ FOWLE ST	0		0.7		7.7	.		.		.	0		0		10	.	
20000 - 9122 - MAIN ST @ GREEN ST	0.3		1.3		6.7	.		.		.	0		0		10	.	
20400 - 9123 - 275 MAIN ST	0		1.3		5.3	.		.		.	0		0		10	.	
20800 - 9124 - MAIN ST @ MONTVALE AVE	0.3		1.3		4.3	.		.		.	0		4		6	.	
21200 - 9127 - MAIN ST @ EVERETT ST	0		1.3		3	.		.		.	1.5		4.5		3	.	
21600 - 9128 - MAIN ST @ MANNING ST	0		0.7		2.3	.		.		.	0		0		3	.	
22000 - 9129 - MAIN ST @ MISHAWUM RD	0		0		2.3	.		.		.	0		0		3	.	
22400 - 9130 - MAIN ST @ PAGE PL	0		0		2.3	.		.		.	0		0		3	.	
22800 - 9131 - MAIN ST @ EATON AVE	0		0		2.3	.		.		.	0		0		3	.	
23200 - 9133 - MAIN ST @ FISHER TERR	0		0		2.3	.		.		.	0		0		3	.	
24000 - 9134 - ELM ST @ MONUMENT	0		0.7		1.7	.		.		.	1.5		3.5		2.5	.	
24400 - 9135 - 31 ELM ST	0		0.3		1.3	.		.		.	0		0		2.5	.	
24800 - 9136 - 53 ELM ST	0		0		1.3	.		.		.	0		0		2.5	.	
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	0		0		1.3	.		.		.	0		0		2.5	.	
26000 - 9139 - MAIN ST @ NICHOLS ST E	0		0.7		0.7	.		.		.	0		0		2.5	.	
26400 - 9140 - 949 MAIN ST	0		0.7		0	.		.		.	0		1		1.5	.	
26800 - 9142 - 979 MAIN ST	0		0		0	.		.		.	0		0		1.5	.	
27200 - 9143 - MAIN ST @ WHEELING AVE	0		0		0	.		.		.	0		0		1.5	.	
27600 - 9144 - 1075 MAIN ST	0		0		0	.		.		.	0		0		1.5	.	
28000 - 8852 - MAIN ST @ N MAPLE ST	0		0		0	.		.		.	0		0		1.5	.	
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	.		.		.	.		.		.	.		.			0	
Maximum					14.3					18					18.5		
Total	18		18			9		16			22.2		28			12.8	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	4.7) [4] !Fall 2012!			20:55 (134.7) [3] !Fall 2012!					21:55 (134.7) [2] !Fall 2012!					22:55 (134.7) [3] !Fall 2012!			
Seq - StopID - Stop Name	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
400 - 5271 - WELLINGTON STATION BUSWAY	0		9	5.3	1	0		5.3	5.5	2	0		5.5	8.7	3	0	
800 - 9318 - CORPORATION WAY AFTER BRIDGE	0		9	0		0		5.3	0		0		5.5	0		0	
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	0.5		9.3	0.7		0		6	0		0		5.5	0		0.3	
1600 - 9045 - FELLSWAY @ BRADBURY AVE	0		9.5	0		0.3		5.7	0		0		5.5	0		0	
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	0		10.5	0		0		5.7	0.5		1		5	0		0	
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	0.3		10.3	0		0		5.7	0		0.5		4.5	0		0.7	
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	0		10.3	0		0		5.7	0		0		4.5	0		0	
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	0		10.3	0		0		5.7	0		0		4.5	0		0.3	
3600 - 49157 - 61 LOCUST ST	3		7.5	1		1.7		5	0.5		2.5		2.5	0		4	
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	1		7.8	0.3		0.7		4.7	0		0		2.5	0.7		0.3	
4400 - 9165 - 350 RIVERSIDE AVE	0.5		7.3	0		0.3		4.3	0		0		2.5	0		0	
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	1.8		5.8	0		1.3		3	0		1.5		1	0		1	
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	0.3		5.5	0		0.3		2.7	0		0		1	0		1	
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	0		5.5	0		0		2.7	0		1		0	0		0.7	
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0		5.5	0		0		2.7	0		0		0	0		0.3	
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0		5.5	0		0.7		2	0		0		0	0		0	
6800 - 9172 - 116 RIVERSIDE AVE	1.3		4.3	0		2		0	0		0		0	0		0	
7200 - 5002 - SALEM ST OPP RIVER ST	.		.	.		.		.	.		.		.	.		.	
7600 - 15002 - HIGH ST @ BRADLEE RD	.		.	.		.		.	.		.		.	.		.	
8000 - 5003 - HIGH ST @ HILLSIDE AVE	.		.	.		.		.	.		.		.	.		.	
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	.		.	.		.		.	.		.		.	.		.	
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	.		.	.		.		.	.		.		.	.		.	
9200 - 5006 - 305 WINTHROP ST	.		.	.		.		.	.		.		.	.		.	
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	.		.	.		.		.	.		.		.	.		.	
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	.		.	.		.		.	.		.		.	.		.	
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	.		.	.		.		.	.		.		.	.		.	
10800 - 9177 - WINTHROP ST @ MEDFORD HS	.		.	.		.		.	.		.		.	.		.	
11200 - 9178 - WINTHROP ST OPP SMITH LN	.		.	.		.		.	.		.		.	.		.	
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	.		.	.		.		.	.		.		.	.		.	
12000 - 9101 - WINTHROP ST @ WINFORD WAY	.		.	.		.		.	.		.		.	.		.	
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	.		.	.		.		.	.		.		.	.		.	
12800 - 9103 - MAIN ST @ TOWN WAY	.		.	.		.		.	.		.		.	.		.	
13200 - 9104 - MAIN ST @ HIGHLAND AVE	.		.	.		.		.	.		.		.	.		.	
13600 - 9105 - MAIN ST @ EVERELL RD	.		.	.		.		.	.		.		.	.		.	
14000 - 9106 - MAIN ST @ MARSHALL RD	.		.	.		.		.	.		.		.	.		.	
14400 - 9107 - MAIN ST @ CHESTNUT ST	.		.	.		.		.	.		.		.	.		.	
14800 - 9108 - MAIN ST @ PROSPECT ST	.		.	.		.		.	.		.		.	.		.	
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	.		.	.		.		.	.		.		.	.		.	
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	.		.	.		.		.	.		.		.	.		.	
16000 - 9111 - MAIN ST @ VINE ST	.		.	.		.		.	.		.		.	.		.	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

	4.7) [4] !Fall 2012!			20:55 (134.7) [3] !Fall 2012!					21:55 (134.7) [2] !Fall 2012!					22:55 (134.7) [3] !Fall 2012!			
Seq - StopID - Stop Name	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff	Load	On	BuildOn	Off	BuildOff
16400 - 9113 - MAIN ST @ LAKE ST	.		.	.		.		.	.		.		.	.		.	
16800 - 9114 - 757 MAIN ST	.		.	.		.		.	.		.		.	.		.	
17200 - 9115 - MAIN ST OPP RICHARDSON ST	.		.	.		.		.	.		.		.	.		.	
17600 - 9116 - 955 MAIN ST	.		.	.		.		.	.		.		.	.		.	
18000 - 9117 - 995 MAIN ST	.		.	.		.		.	.		.		.	.		.	
18400 - 9118 - MAIN ST @ CRANES CT	.		.	.		.		.	.		.		.	.		.	
18800 - 9119 - MAIN ST @ VINING CT	.		.	.		.		.	.		.		.	.		.	
19200 - 9120 - MAIN ST @ RICHARDSON ST	.		.	.		.		.	.		.		.	.		.	
19600 - 9121 - MAIN ST @ FOWLE ST	.		.	.		.		.	.		.		.	.		.	
20000 - 9122 - MAIN ST @ GREEN ST	.		.	.		.		.	.		.		.	.		.	
20400 - 9123 - 275 MAIN ST	.		.	.		.		.	.		.		.	.		.	
20800 - 9124 - MAIN ST @ MONTVALE AVE	.		.	.		.		.	.		.		.	.		.	
21200 - 9127 - MAIN ST @ EVERETT ST	.		.	.		.		.	.		.		.	.		.	
21600 - 9128 - MAIN ST @ MANNING ST	.		.	.		.		.	.		.		.	.		.	
22000 - 9129 - MAIN ST @ MISHAWUM RD	.		.	.		.		.	.		.		.	.		.	
22400 - 9130 - MAIN ST @ PAGE PL	.		.	.		.		.	.		.		.	.		.	
22800 - 9131 - MAIN ST @ EATON AVE	.		.	.		.		.	.		.		.	.		.	
23200 - 9133 - MAIN ST @ FISHER TERR	.		.	.		.		.	.		.		.	.		.	
24000 - 9134 - ELM ST @ MONUMENT	.		.	.		.		.	.		.		.	.		.	
24400 - 9135 - 31 ELM ST	.		.	.		.		.	.		.		.	.		.	
24800 - 9136 - 53 ELM ST	.		.	.		.		.	.		.		.	.		.	
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	.		.	.		.		.	.		.		.	.		.	
26000 - 9139 - MAIN ST @ NICHOLS ST E	.		.	.		.		.	.		.		.	.		.	
26400 - 9140 - 949 MAIN ST	.		.	.		.		.	.		.		.	.		.	
26800 - 9142 - 979 MAIN ST	.		.	.		.		.	.		.		.	.		.	
27200 - 9143 - MAIN ST @ WHEELING AVE	.		.	.		.		.	.		.		.	.		.	
27600 - 9144 - 1075 MAIN ST	.		.	.		.		.	.		.		.	.		.	
28000 - 8852 - MAIN ST @ N MAPLE ST	.		.	.		.		.	.		.		.	.		.	
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	4.3		0	0		0		0	0		0		0	0		0.7	
Maximum			10.5					6					5.5				
Total	12.8			7.3		7.3			6.5		6.5			9.3		9.3	

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

		23:55 (134.7) [2] !Fall 2012!					25:05 (134.7) [2] !Spring 2012!					Total		
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On		Off		Load	On	Off	Load
400 - 5271 - WELLINGTON STATION BUSWAY	8.7	8	3	0		8	6.5	3	0		6.5	424.8	0	418.9
800 - 9318 - CORPORATION WAY AFTER BRIDGE	8.7	0		0		8	0		0		6.5	9.5	2.3	426.4
1200 - 9319 - FELLSWAY @ MIDDLESEX AVE - WE	8.3	0		0		8	0		0		6.5	7.6	7.6	484.2
1600 - 9045 - FELLSWAY @ BRADBURY AVE	8.3	0		0		8	0		0		6.5	6.2	4	486.3
2000 - 9162 - RIVERSIDE AVE @ FELLSWAY	8.3	0		0.5		7.5	0		0		6.5	22.8	11.7	496.5
2400 - 9163 - RIVERSIDE AVE OPP COMMERCIAL	7.7	0		0		7.5	0		0		6.5	0.9	2.9	494.9
2800 - 9164 - RIVERSIDE AVE OPP HALL ST	7.7	0		0		7.5	0		0		6.5	0.5	0.3	495
3200 - 49164 - 400 RIVERSIDE AVE OPP LINDEN	7.3	0		3		4.5	0		0		6.5	1	7.1	488.7
3600 - 49157 - 61 LOCUST ST	3.3	0		2.5		2	0		3		6	17	69.3	444
4000 - 49158 - MEADOW GLEN MALL @ MAIN ENTRA	3.7	0		0		2	0		0		6	61.1	171.9	339.4
4400 - 9165 - 350 RIVERSIDE AVE	3.7	0		1.5		0.5	0		0		6	3.5	16.1	327.9
4800 - 9167 - RIVERSIDE AVE @ HUNEWILL AVE	2.7	0		0		0.5	0		0.5		4.5	7.5	18.9	317.7
5200 - 9168 - RIVERSIDE AVE @ CAROLINA ST	1.7	0		0		0.5	0		0		4.5	4	4.3	317.7
5600 - 9169 - RIVERSIDE AVE @ PEMBROKE ST	1	0		0		0.5	0		1		3.5	1.8	12	307.8
6000 - 9170 - RIVERSIDE AVE @ PARK ST	0.7	0		0		0.5	0		0		3.5	3.7	5.8	305.1
6400 - 9171 - RIVERSIDE AVE @ PLEASANT ST	0.7	0		0.5		0	0		0		3.5	0	4.1	301.3
6800 - 9172 - 116 RIVERSIDE AVE	0.7	0		0		0	0		0		3.5	0.3	17.8	285.4
7200 - 5002 - SALEM ST OPP RIVER ST	.	.		.		.	.		.		.	19.1	44	253.4
7600 - 15002 - HIGH ST @ BRADLEE RD	.	.		.		.	.		.		.	5.5	9.7	249.5
8000 - 5003 - HIGH ST @ HILLSIDE AVE	.	.		.		.	.		.		.	2.3	5.6	246.9
8400 - 5004 - HIGH ST @ POWDER HOUSE RD	.	.		.		.	.		.		.	1.5	3.2	245
8800 - 5005 - HIGH ST @ RURAL AVE - WINTHRO	.	.		.		.	.		.		.	3.6	7.1	241.6
9200 - 5006 - 305 WINTHROP ST	.	.		.		.	.		.		.	0	0	241.6
9600 - 9174 - WINTHROP ST @ LAWRENCE RD	.	.		.		.	.		.		.	0.3	3	239
10000 - 9175 - WINTHROP ST @ WOODSIDE AVE	.	.		.		.	.		.		.	0.5	1	238.5
10400 - 9176 - 475 WINTHROP ST @ TEMPLE SHAL	.	.		.		.	.		.		.	0	0.6	238
10800 - 9177 - WINTHROP ST @ MEDFORD HS	.	.		.		.	.		.		.	0	12.1	226.2
11200 - 9178 - WINTHROP ST OPP SMITH LN	.	.		.		.	.		.		.	0	0	226.2
11600 - 8692 - WINTHROP ST @ PLAYSTEAD RD	.	.		.		.	.		.		.	3.5	13	219
12000 - 9101 - WINTHROP ST @ WINFORD WAY	.	.		.		.	.		.		.	0	2.9	210.7
12400 - 9102 - 713 WINTHROP ST OPP ROBINSON	.	.		.		.	.		.		.	0.5	0	211.2
12800 - 9103 - MAIN ST @ TOWN WAY	.	.		.		.	.		.		.	0	1	210.2
13200 - 9104 - MAIN ST @ HIGHLAND AVE	.	.		.		.	.		.		.	0	0	210.2
13600 - 9105 - MAIN ST @ EVERELL RD	.	.		.		.	.		.		.	0	1	209.2
14000 - 9106 - MAIN ST @ MARSHALL RD	.	.		.		.	.		.		.	0	0	209.2
14400 - 9107 - MAIN ST @ CHESTNUT ST	.	.		.		.	.		.		.	0	0.5	208.7
14800 - 9108 - MAIN ST @ PROSPECT ST	.	.		.		.	.		.		.	0	0.5	208.2
15200 - 9109 - MAIN ST @ FAIRVIEW TERR	.	.		.		.	.		.		.	0	0	208.2
15600 - 9110 - LARAWAY RD @ WINCHESTER CTR	.	.		.		.	.		.		.	5.9	16.7	197.2
16000 - 9111 - MAIN ST @ VINE ST	.	.		.		.	.		.		.	0	3.2	193.7

Massachusetts Bay Transportation Authority
Route 134
Saturday - Outbound
Fall 2012
(Urban Transportation Associates)

		23:55 (134.7) [2] !Fall 2012!					25:05 (134.7) [2] !Spring 2012!					Total		
Seq - StopID - Stop Name	Load	On	BuildOn	Off	BuildOff	Load	On		Off		Load	On	Off	Load
16400 - 9113 - MAIN ST @ LAKE ST	.	.		.		.	.		.		.	2.9	10.1	186.6
16800 - 9114 - 757 MAIN ST	.	.		.		.	.		.		.	2	6	182.6
17200 - 9115 - MAIN ST OPP RICHARDSON ST	.	.		.		.	.		.		.	2	15.4	169.3
17600 - 9116 - 955 MAIN ST	.	.		.		.	.		.		.	0.7	5.8	164.3
18000 - 9117 - 995 MAIN ST	.	.		.		.	.		.		.	0	1.3	162.9
18400 - 9118 - MAIN ST @ CRANES CT	.	.		.		.	.		.		.	0.3	4.9	158.3
18800 - 9119 - MAIN ST @ VINING CT	.	.		.		.	.		.		.	0.6	4.6	154.3
19200 - 9120 - MAIN ST @ RICHARDSON ST	.	.		.		.	.		.		.	0	0.5	153.8
19600 - 9121 - MAIN ST @ FOWLE ST	.	.		.		.	.		.		.	0.5	7	147.6
20000 - 9122 - MAIN ST @ GREEN ST	.	.		.		.	.		.		.	2.3	9.7	140.2
20400 - 9123 - 275 MAIN ST	.	.		.		.	.		.		.	0.5	4	136.6
20800 - 9124 - MAIN ST @ MONTVALE AVE	.	.		.		.	.		.		.	2.6	33.9	105.3
21200 - 9127 - MAIN ST @ EVERETT ST	.	.		.		.	.		.		.	9.2	30.6	84
21600 - 9128 - MAIN ST @ MANNING ST	.	.		.		.	.		.		.	0.5	3.2	81.3
22000 - 9129 - MAIN ST @ MISHAWUM RD	.	.		.		.	.		.		.	0	1.8	79.5
22400 - 9130 - MAIN ST @ PAGE PL	.	.		.		.	.		.		.	0	3.6	75.9
22800 - 9131 - MAIN ST @ EATON AVE	.	.		.		.	.		.		.	0.5	3	73.4
23200 - 9133 - MAIN ST @ FISHER TERR	.	.		.		.	.		.		.	0.3	3.7	70
24000 - 9134 - ELM ST @ MONUMENT	.	.		.		.	.		.		.	3.8	29.2	46.3
24400 - 9135 - 31 ELM ST	.	.		.		.	.		.		.	0	0.6	45.5
24800 - 9136 - 53 ELM ST	.	.		.		.	.		.		.	0	1	44.5
25200 - 9137 - 73 ELM ST OPP TRAVERSE ST	.	.		.		.	.		.		.	1.1	5.5	40.1
26000 - 9139 - MAIN ST @ NICHOLS ST E	.	.		.		.	.		.		.	0	5.5	34.6
26400 - 9140 - 949 MAIN ST	.	.		.		.	.		.		.	0	7.7	26.9
26800 - 9142 - 979 MAIN ST	.	.		.		.	.		.		.	0	2	24.9
27200 - 9143 - MAIN ST @ WHEELING AVE	.	.		.		.	.		.		.	0	1	23.9
27600 - 9144 - 1075 MAIN ST	.	.		.		.	.		.		.	0	1.7	22.2
28000 - 8852 - MAIN ST @ N MAPLE ST	.	.		.		.	.		.		.	0	19.4	2.8
28040 - 45002 - MEDFORD SQ @ CITY HALL PARKIN	0	0		0		0	0		3.5		0	0	8.5	0
Maximum	8.7					8					6.5	0	0	517.2
Total		8		8			6.5		8			645.1	712.1	0

Bus Travel Time Analysis

Scheduled Routes

Wynn Everett

2/3/2015

Bus Routes through Study Area Intersections

Prepared by Howard/Stein-Hudson Associates

Intersection Number	Location/City	MBTA Bus Route																		
		86	89	90	91	92	93	95	97	99	100	101	104	105	106	108	109	110	112	134
1	Horizon Way/Broadway (Route 99), Everett												X	X			X			
3	Lynde Street/Broadway (Route 99), Everett												X	X			X			
5	Thorndike Street/Broadway (Route 99), Everett												X	X			X			
7	Beacham Street/Broadway (Route 99), Everett												X	X			X			
8	Bowdoin Street/Broadway (Route 99), Everett												X	X			X			
10	Revere Beach Parkway (Route 16)/Santilli Highway/Mystic View Road/Route 99 Connector (Santilli Circle), Everett								X						X			X	X	
11	Revere Beach Parkway (Route 16)/Broadway (Route 99)/Main Street (Sweetser Circle), Everett								X				X	X	X		X	X	X	
28	Revere Beach Parkway (Route 16)/Union Street, Chelsea																			
38	Harvard Avenue/Mystic Avenue (Route 38)/Mystic Valley Parkway, Medford							X				X								
39	Mystic Valley Parkway (Route 16)/Mystic Valley Parkway (Route 16) Southbound Connector, Medford							X				X								
42	Mystic Valley Parkway (Route 16)/Fellsway (Route 28)/Middlesex Avenue (Wellington Circle), Medford			X						X	X					X				X
51	Dexter Street/Alford Street (Route 99), Boston												X	X			X			
52	Cambridge Street/I-93 Northbound Off-ramp, Boston	X			X							X								
53	Main Street/Maffa Way/Cambridge Street/Alford Street (Sullivan Square), Boston	X			X	X	X	X				X	X	X			X			
54	Austin Street/Rutherford Avenue, Boston																			
55	New Rutherford Avenue (Route 99)/Route 1 Ramps, Boston																			
56	New Rutherford Avenue (Route 99)/Chelsea Street (City Square), Boston																			

FRIDAY PM PEAK HOUR

MBTA Bus Route	Existing Travel Time (minutes) (based on MBTA Aug-Sept 2014)		No Build Added Delay		Average # additional passengers (3pm-4pm)		Build Added Delay (sec) (vs. no build)		Build with Mitigation Δ Delay (sec) (vs. No Build)		% Change in Travel Time (vs. No Build)	
	Inbound	Outbound	Inbound	Outbound	IB	OB	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
CT2	48 min	56 min	2.1	1.8	0	0	2.8	2.7	3.6	16.4	0.1%	0.5%
86	56 min	54 min	2.1	1.8	0	0	2.8	2.7	3.6	16.4	0.1%	0.5%
89	20 min	26 min	0	0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
90	36 min	30 min	0	0	1	1	7.8	8.4	37.4	-43.0	1.7%	-2.4%
91	18 min	20 min	2.1	1.8	0	0	2.8	2.7	3.6	16.4	0.3%	1.4%
92	15 min	23 min	1.2	0.4	0	0	3.6	0.7	25.4	32.4	2.8%	2.3%
93	19 min	25 min	1.2	0.4	0	0	2.4	-24.1	18.1	15.6	1.6%	1.0%
95	21 min	25 min	0.6	18.2	0	0	0.0	0.0	-9.5	-12.6	-0.8%	-0.8%
97	22 min	24 min	236	104.9	0	0	-8.8	8.0	-332.5	-171.5	-21.4%	-11.1%
99	25 min	33 min	1.9	122.0	0	0	1.7	24.8	6.6	-191.6	0.4%	-9.1%
100	17 min	17 min	165.3	45.8	2	1	46.5	16.9	-317.9	23.5	-26.8%	2.2%
101	26 min	34 min	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
104	20 min	28 min	12.4	440.8	4	3	91.7	234.3	98.9	-517.9	8.2%	-24.4%
105	29 min	28 min	12.4	440.8	2	1	81.4	224.0	88.6	-528.2	5.1%	-24.9%
106	33 min	32 min	1.9	122.0	0	0	1.7	24.8	6.6	-191.6	0.3%	-9.4%
108	27 min	36 min	165.3	45.8	0	0	33.6	4.0	-330.8	10.6	-18.5%	0.5%
109	22 min	28 min	12.4	440.8	4	3	91.7	234.3	98.9	-517.9	7.4%	-24.4%
110	29 min	36 min	1.9	122.0	0	0	1.7	24.8	6.6	-191.6	0.4%	-8.4%
112	48 min	45 min	1.9	122.0	0	0	1.7	24.8	6.6	-191.6	0.2%	-6.8%
134	20 min	23 min	165.3	45.8	3	1	51.7	11.8	-312.7	7.8	-22.9%	0.5%
710	30 min	30 min	165.3	45.8	0	0	33.6	4.0	-330.8	10.6	-16.8%	0.6%

Assumed added dwell time per passenger (sec)[1]: 1.31+2.573*BA, where BA= number of boardings+alightings

For example, 10 additional passengers create an additional 2*(1.31+2.573*10)=54.1 seconds of delay.

1) Feder R.C. The Effect of Bus Stop Spacing and Location on Travel Time, Transportation 31 Research Institute– Carnegie Mellon University, Pittsburgh, 1973

* MBTA Bus Route 90 does not travel through any study area intersections. Calculated delay based on added passenger load only.

Wynn Everett
MBTA Bus Travel Time Comparison

Howard/Stein-Hudson Associates
1/28/2015

FRIDAY PM "REAL" PEAK HOUR

MBTA Bus Route	Existing Travel Time (min) (based on MBTA schedule 8/13/2014)		No Build Added Delay		Average # additional passengers (3pm-4pm)		Build Added Delay (sec) (vs. no build)		Build with Mitigation Δ Delay (sec) (vs. No Build)		% Change in Travel Time (vs. No Build)	
	Inbound	Outbound	Inbound	Outbound	IB	OB	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
CT2	48 min	56 min	1.8	2.1	0	0	2.7	2.8	-16.3	56.3	-0.6%	1.7%
86	56 min	54 min	1.8	2.1	0	0	2.7	2.8	-16.3	56.3	-0.5%	1.7%
89	20 min	26 min	0	0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
90	36 min	30 min	0	0	1	1	7.8	8.1	37.4	-43.6	1.7%	-2.4%
91	18 min	20 min	1.8	2.1	0	0	2.7	2.8	-16.3	56.3	-1.5%	4.7%
92	15 min	23 min	1.1	0.4	0	0	1.3	0.3	12.0	32.4	1.3%	2.3%
93	19 min	25 min	1.1	0.4	0	0	2.9	-24.7	13.9	-22.6	1.2%	-1.5%
95	21 min	25 min	0.6	18.2	0	0	0.0	0.0	-9.5	-12.6	-0.8%	-0.8%
97	22 min	24 min	236	104.9	0	0	19.4	32.1	-335.1	-170.7	-21.5%	-11.0%
99	25 min	33 min	1.9	122.0	0	0	1.0	48.9	6.6	-157.0	0.4%	-7.5%
100	17 min	17 min	165.3	45.8	2	1	17.5	10.3	-221.0	17.9	-18.6%	1.7%
101	26 min	34 min	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
104	20 min	28 min	12.4	440.9	4	3	57.7	135.4	73.6	-500.0	6.1%	-23.6%
105	29 min	28 min	12.4	440.9	2	1	47.4	125.1	63.3	-510.3	3.6%	-24.1%
106	33 min	32 min	1.9	122.0	0	0	1.0	48.9	6.6	-157.0	0.3%	-7.7%
108	27 min	36 min	165.3	45.8	0	0	19.1	2.5	-331.5	10.1	-18.6%	0.5%
109	22 min	28 min	12.4	440.9	4	3	58.4	127.6	73.6	-500.0	5.5%	-23.6%
110	29 min	36 min	1.9	122.0	0	0	1.0	48.9	6.6	-157.0	0.4%	-6.9%
112	48 min	45 min	1.9	122.0	0	0	1.0	48.9	6.6	-157.0	0.2%	-5.6%
134	20 min	23 min	165.3	45.8	3	1	37.2	10.3	-313.4	17.9	-23.0%	1.3%
710	30 min	30 min	165.3	45.8	0	0	19.1	2.5	-331.5	10.1	-16.9%	0.5%

Assumed added dwell time per passenger (sec)[1]: 1.31+2.573*BA, where BA= number of boardings+alightings

For example, 10 additional passengers create an additional 2*(1.31+2.573*10)=54.1 seconds of delay.

1) Feder R.C. The Effect of Bus Stop Spacing and Location on Travel Time, Transportation 31 Research Institute– Carnegie Mellon University, Pittsburgh, 1973
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SATURDAY AFTERNOON PEAK HOUR

MBTA Bus Route	Existing Travel Time (minutes) (based on MBTA Aug-Sept 2014)		No Build Added Delay		Average # additional passengers (12pm-1pm)		Build Added Delay (sec) (vs. no build)		Build with Mitigation Δ Delay (sec) (vs. No Build)		% Change in Travel Time (vs. No Build)	
	Inbound	Outbound	Inbound	Outbound	IB	OB	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
CT2	- min	- min										
86	43 min	42 min	0.7	0.9	0	0	-0.1	0.2	16.2	14.5	0.6%	0.6%
89	20 min	19 min	0	0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
90	26 min	29 min	4.8	41.7	1	1	7.8	8.1	37.4	-43.6	2.4%	-2.4%
91	18 min	14 min	0.7	0.9	0	0	-0.1	0.2	16.2	14.5	1.5%	1.7%
92	23 min	23 min	0.2	0.5	0	0	0.7	0.6	-4.7	16.4	-0.3%	1.2%
93	16 min	21 min	0.2	0.5	0	0	0.7	0.6	-4.7	16.4	-0.5%	1.3%
95	17 min	22 min	-0.4	1	0	0	0.0	0.0	-9.4	6.6	-0.9%	0.5%
97	23 min	22 min	117.9	75.6	0	0	113.6	74.2	-171.1	-174.1	-11.4%	-12.5%
99	28 min	31 min	3.8	119.3	0	0	2.5	82.0	6.5	-172.4	0.4%	-8.7%
100	11 min	11 min	55.8	7.9	2	2	42.5	34.7	-96.7	15.0	-13.5%	2.2%
101	24 min	35 min	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0.0%	0.0%
104	22 min	27 min	67.2	65.7	4	6	178.3	272.4	23.6	-83.2	1.7%	-4.9%
105	24 min	27 min	67.2	65.7	3	4	173.2	262.1	18.5	-93.5	1.2%	-5.5%
106	27 min	27 min	3.8	119.3	0	0	2.5	82.0	6.5	-172.4	0.4%	-9.9%
108	24 min	30 min	55.8	7.9	0	0	42.5	34.7	-96.7	15.0	-6.5%	0.8%
109	22 min	26 min	67.2	65.7	4	6	178.3	272.4	23.6	-83.2	1.7%	-5.1%
110	26 min	26 min	3.8	119.3	0	0	2.5	82.0	6.5	-172.4	0.4%	-10.3%
112	47 min	49 min	3.8	119.3	0	0	2.5	82.0	6.5	-172.4	0.2%	-5.6%
134	42 min	43 min	63.1	11.4	2	3	55.4	52.8	-83.8	33.1	-3.2%	1.3%
710	- min	- min										

Assumed added dwell time per passenger (sec)[1]: 1.31+2.573*BA, where BA= number of boardings+alightings

For example, 10 additional passengers create an additional 2*(1.31+2.573*10)=54.1 seconds of delay

1) Feder R.C. The Effect of Bus Stop Spacing and Location on Travel Time, Transportation 31 Research Institute– Carnegie Mellon University, Pittsburgh, 1973
* MBTA Bus Route 90 does not travel through any study area intersections. Calculated delay based on added passenger load only.

Pull-Out/Deadhead Trips

From	To	Assumed Route	Existing Duration (min)	Added No Build Delay (sec)	Build Delay (sec) (above No Build)	Build with Mitigation Delay (sec) (above No Build)	% Change in Travel Time (Build with Mitigation vs. No Build)
Broadway and Park	Charlestown Garage	Route 16/Route 99	17	142.2	56.4	-165.2	-14.36%
Central Square	Somerville Garage	Prospect St./Washington St.	18	112.7	127.4	-206.1	-17.28%
Charlestown Garage	Broadway and Park	Route 99/Route 16	15	460.4	238.4	-540.5	-39.73%
Charlestown Garage	Glendale Square	Broadway (Route 99)	12	460.4	238.4	-540.5	-45.79%
Charlestown Garage	Haymarket	Rutherford Avenue	12	36.4	52.7	22.1	2.92%
Charlestown Garage	Lebanon Street	Broadway (Route 99)	16	460.4	238.4	-540.5	-38.05%
Charlestown Garage	Linden Square	Commercial St/Wellington	15	4.8	0	31.8	3.51%
Charlestown Garage	Malden	Commercial St./Wellington	42	4.8	0	31.8	1.26%
Charlestown Garage	State Street Stop Express	Rutherford Avenue	23	36.4	52.7	22.1	1.56%
Charlestown Garage	Washington and Cary	Route 99/Route 16	16	532.2	260.9	-579.4	-38.83%
Charlestown Garage	Washington/Revere Beach Pkwy	Route 99/Route 16	12	532.2	260.9	-579.4	-46.27%
Charlestown Garage	Wellington	Middlesex Avenue	15	4.8	0	31.8	3.51%
Charlestown Garage	Wonderland	Rutherford Ave/Route 1A	14	35.1	55.7	24	2.74%
Charlestown Garage	Wood Island	Rutherford Avenue	17	36.4	52.7	22.1	2.09%
Charlestown Garage	Woodlawn	Broadway (Route 99)	13	532.2	260.9	-579.4	-44.15%
Glendale Square	Charlestown Garage	Broadway (Route 99)	12	142.2	127.4	-206.1	-23.90%
Harvard - Holyoke Gate	Somerville Garage	Cambridge St./Washington St.	20	112.7	124	-33.4	-2.54%
Harvard Bus Tunnel	Somerville Garage	Washington St./Sullivan Sq.	20	112.7	124	-33.4	-2.54%
Haymarket	Charlestown Garage	Sullivan Square/I-93	10	5.8	2.8	-2.5	-0.41%
Kendall	Somerville Garage	Rutherford Avenue	15	5.9	52.1	-3.6	-0.40%
Lechmere	Somerville Garage	Rutherford Avenue	13	5.9	52.1	-3.6	-0.46%
Somerville Garage	Broadway at Felton	Washington St./Broadway	20	2.4	3.2	27.8	2.31%
Somerville Garage	Cambridge at Felton	Washington St./Cambridge St.	20	2.4	3.2	27.8	2.31%
Somerville Garage	Cambridge Common	Cambridge St./Washington St.	20	2.4	3.2	27.8	2.31%
Somerville Garage	Central Square	Washington St./Prospect St.	18	2.4	3.2	27.8	2.57%
Somerville Garage	Harvard Bus Tunnels	Washington St./Cambridge St.	20	2.4	3.2	48.6	4.04%
Somerville Garage	Harvard Holyoke Gate	Washington St./Cambridge St.	20	2.4	3.2	27.8	2.31%
Somerville Garage	Kendall	Rutherford Avenue	15	36.4	52.7	22.1	2.36%
Somerville Garage	Lechmere	Rutherford Avenue	13	36.4	52.7	22.1	2.71%
Somerville Garage	Oak Square	Rutherford Avenue	28	36.4	52.7	22.1	1.29%
Somerville Garage	University Park	Rutherford Avenue	21	36.4	52.7	22.1	1.70%
University Park	Somerville Garage	Rutherford Avenue	17	5.9	52.1	-3.6	-0.35%
Washington and Cary	Charlestown Garage	Route 99/Route 16	16	94.2	101.6	-59.7	-5.66%
Wellington	Charlestown Garage	Route 99/Route 16	11	117.9	66.1	-134.9	-17.34%
Wonderland	Charlestown Garage	Route 99/Route 16	20	223.7	225	-203	-14.26%
Woodlawn	Charlestown Garage	Broadway (Route 99)	13	12	67.8	43.2	5.45%

Wynn Everett

Howard/Stein-Hudson Associates

MBTA Bus Deadhead Travel Time Comparison Worksheet

1/28/2015

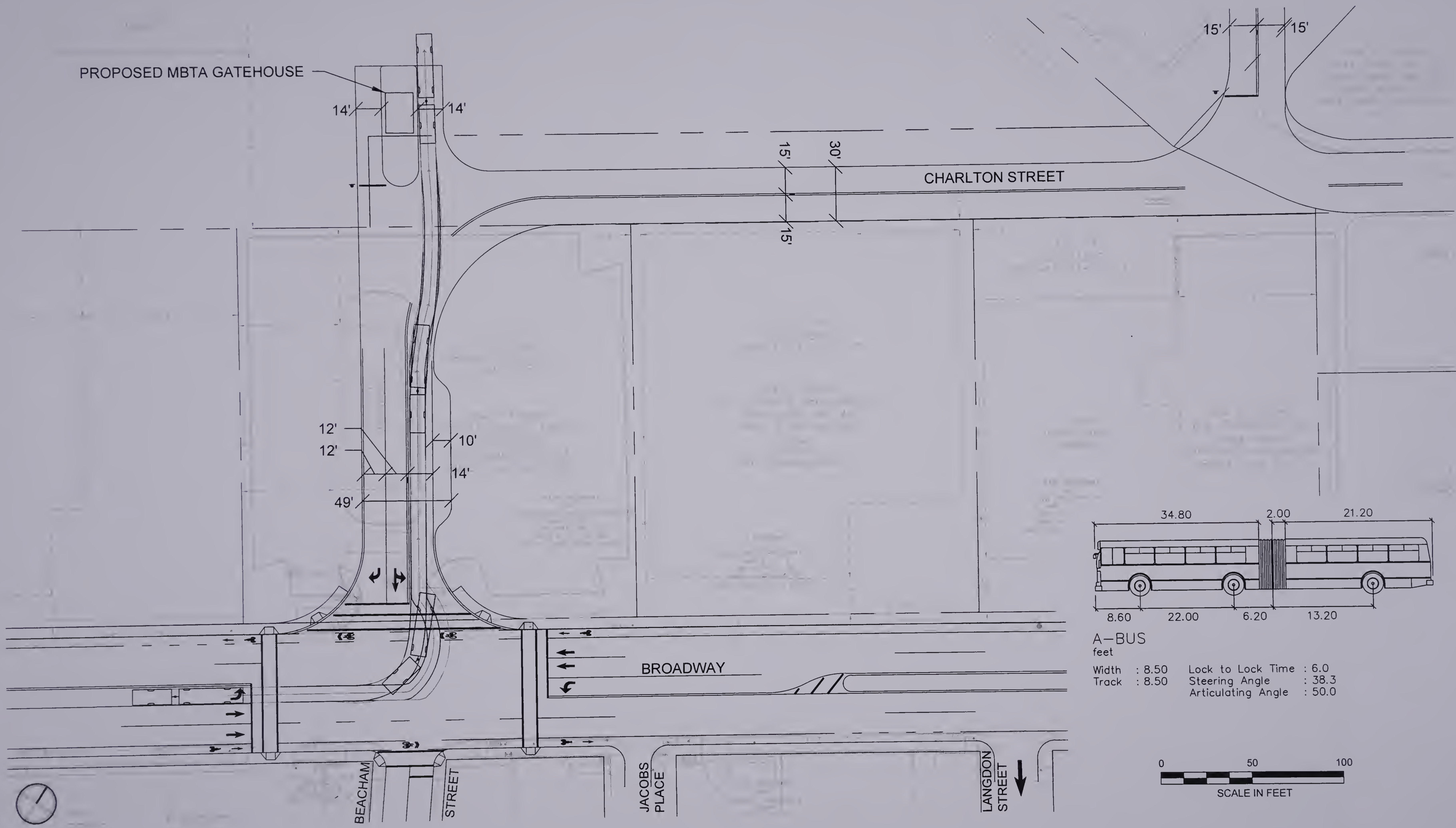
Saturday

From	To	Assumed Route	Existing Duration (min)	Added No Build Delay (sec)	Build Delay (sec) (above No Build)	Build with Mitigation Delay (sec) (above No Build)	% Change in Travel Time (Build with Mitigation vs. No Build)
Cambridge Common	Somerville Garage	Washington St./Cambridge St.	20	14.7	82.4	-51.9	-4.27%
Central Square	Somerville Garage	Prospect St./Washington St.	18	14.7	82.4	-51.9	-4.74%
Charlestown Garage	Haymarket	Rutherford Avenue	12	7.3	4.2	0.00	0.00%
Charlestown Garage	Lebanon Street	Broadway (Route 99)	20	62.3	236.2	-105.9	-8.39%
Charlestown Garage	Linden Square	Route 99/Route 16	17	62.3	236.2	-105.9	-9.78%
Charlestown Garage	Malden Station	Commercial Street/Wellington	16	0.7	0	12.7	1.32%
Charlestown Garage	Revere House	Rutherford Avenue	25	62.3	236.2	-105.9	-8.39%
Charlestown Garage	Washington and Cary	Route 99/Route 16	12	65.1	236.8	-105.3	-13.41%
Charlestown Garage	Wellington	Middlesex Avenue	15	0.7	0	12.7	1.41%
Charlestown Garage	Wonderland	Rutherford Avenue	22	7.3	4.2	0	0.00%
Charlestown Garage	Wood Island	Rutherford Avenue	17	7.3	4.2	0	0.00%
Charlestown Garage	Woodlawn	Broadway (Route 99)	13	62.3	236.2	-105.9	-12.57%
Harvard	Somerville Garage	Cambridge St./Washington St.	18	14.7	82.4	-51.9	-4.74%
Harvard Holyoke Gate	Somerville Garage	Washington St./Cambridge St.	15	14.7	82.4	-51.9	-4.74%
Haymarket	Charlestown Garage	Sullivan Square/I-93	10	21.7	330.7	-358	-57.58%
Lechmere	Somerville Garage	Rutherford Avenue	10	21.8	0.5	0.5	0.08%
Somerville Garage	Cambridge Common	Cambridge St./Washington St.	20	0.5	0.7	19.9	1.66%
Somerville Garage	Central Square	Washington St./Prospect St.	18	0.5	0.7	19.9	1.84%
Somerville Garage	Harvard	Cambridge St./Washington St.	25	0.8	0.7	19.9	1.33%
Somerville Garage	Lechmere	Rutherford Avenue	11	7.3	4.2	0	0.00%
Somerville Garage	University Park	Rutherford Avenue	19	7.3	4.2	0	0.00%
University Park	Somerville Garage	Cambridge St./Washington St.	15	0.8	0.7	19.9	2.21%
Washington and Cary	Charlestown Garage	Route 99/Route 16	12	64.7	159.9	-30.1	-3.84%
Wellington	Charlestown Garage	Route 99/Route 16	11	96.4	206.7	-84.1	-11.12%
Wood Island	Charlestown Garage	Rutherford Avenue	17	21.7	330.70	-358	-34.37%
Woodlawn	Charlestown Garage	Broadway (Route 99)	11	25.7	142.1	35.7	5.21%

B.11 Loading Dock

a. Autoturn Analysis

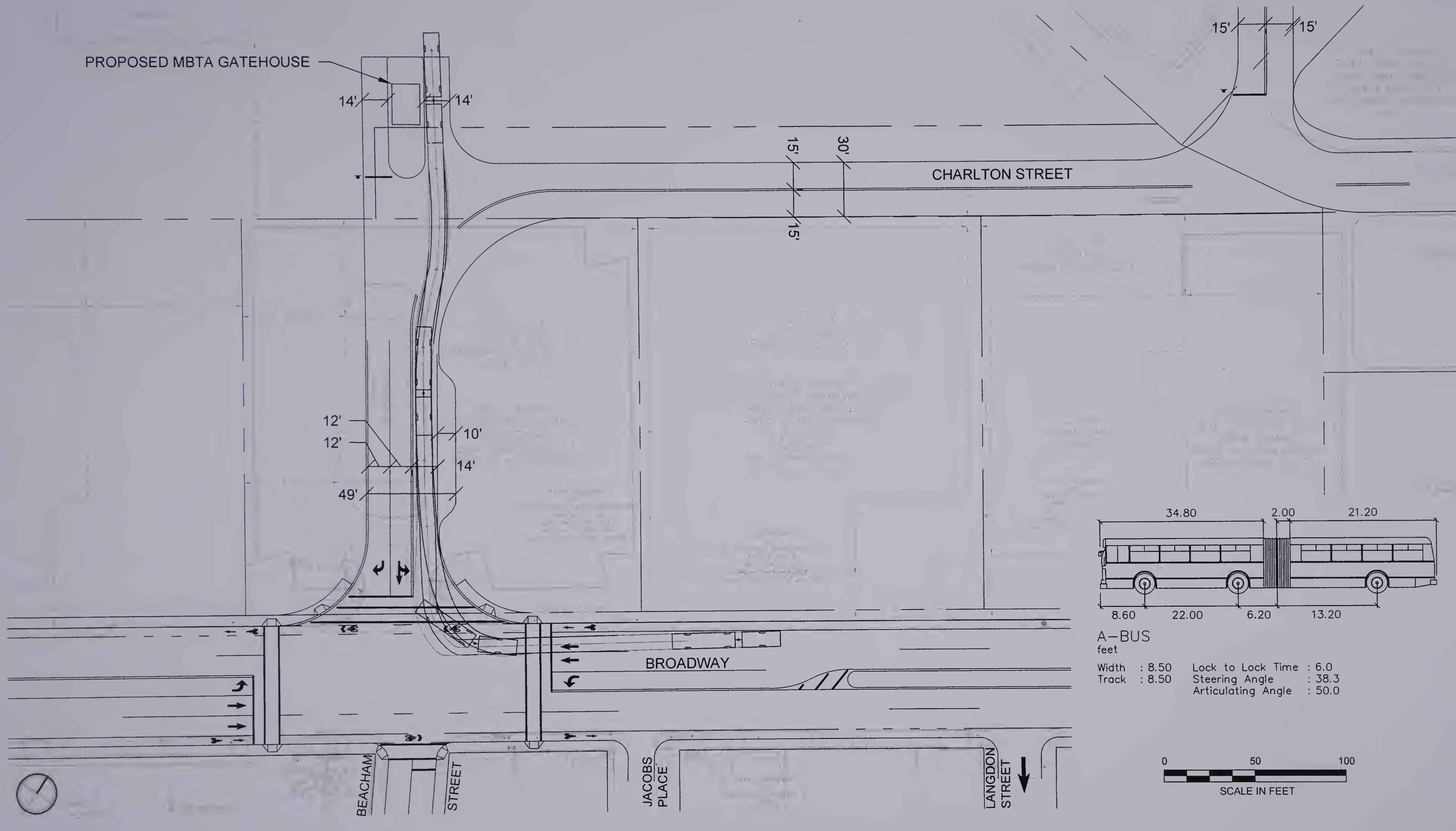
Autoturn Analysis



Appendix B.11A

Articulated Bus Entering MBTA Everett Shops from South

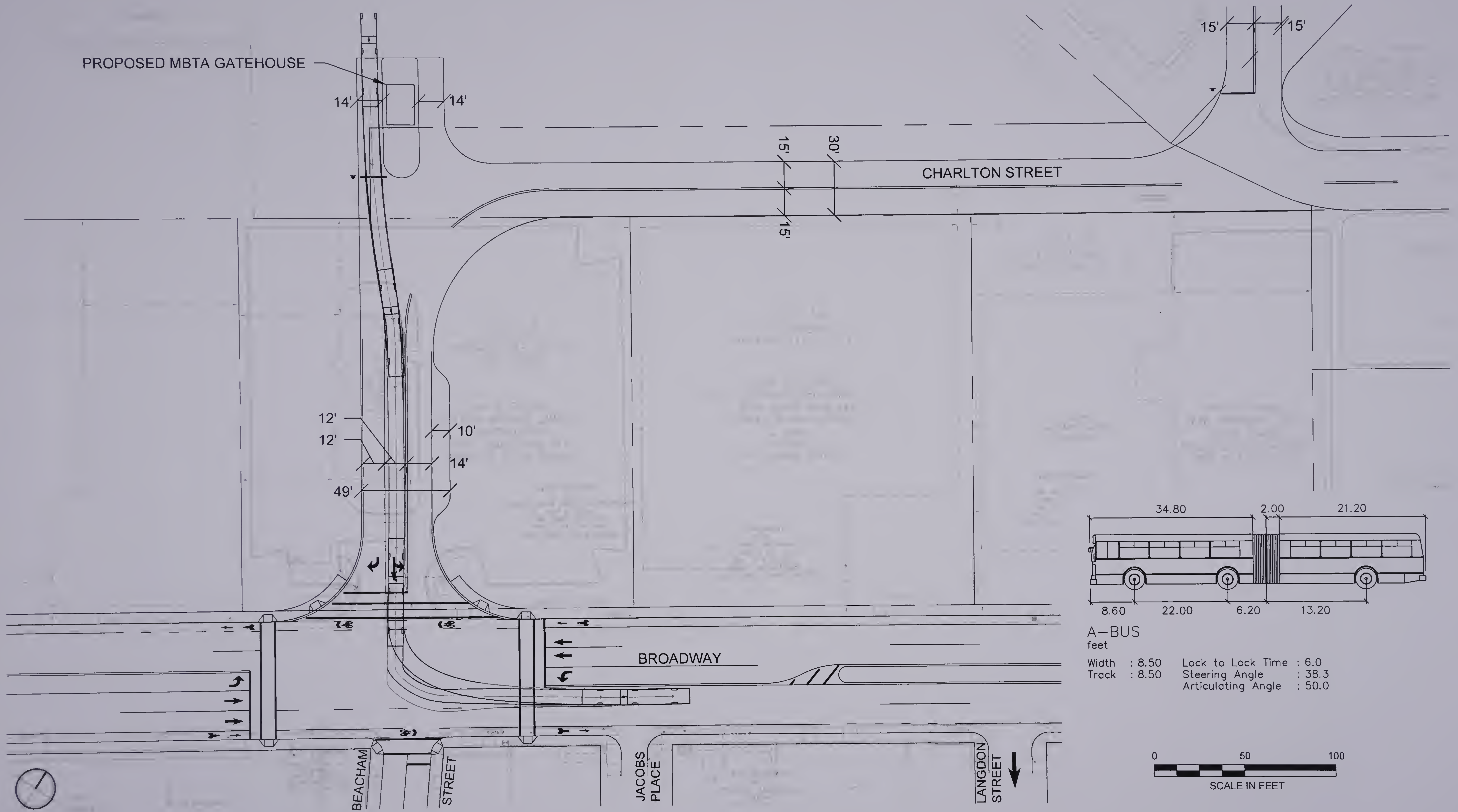
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11B

Articulated Bus Entering MBTA Everett Shops from North

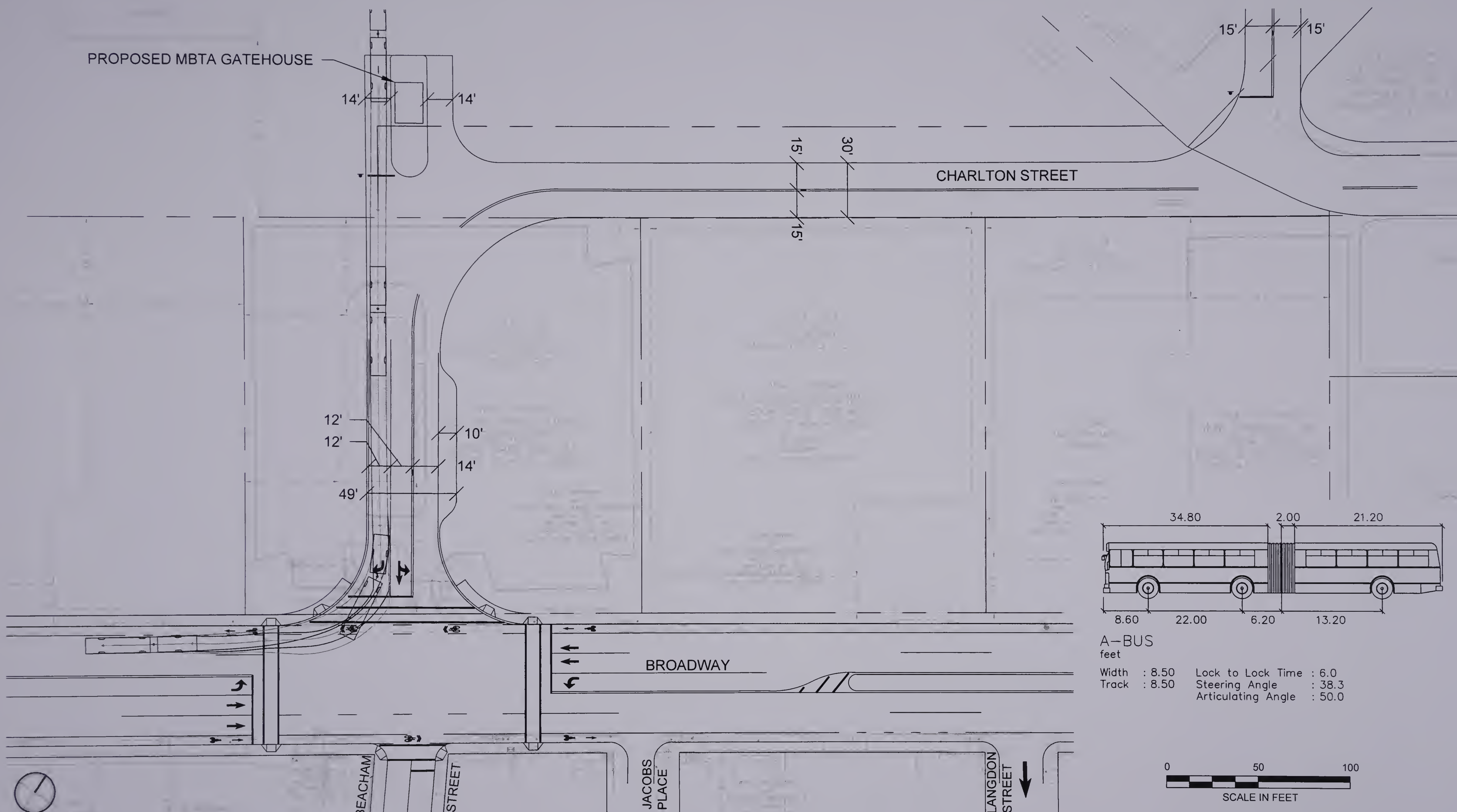
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11C

Articulated Bus Exiting MBTA Everett Shops to North

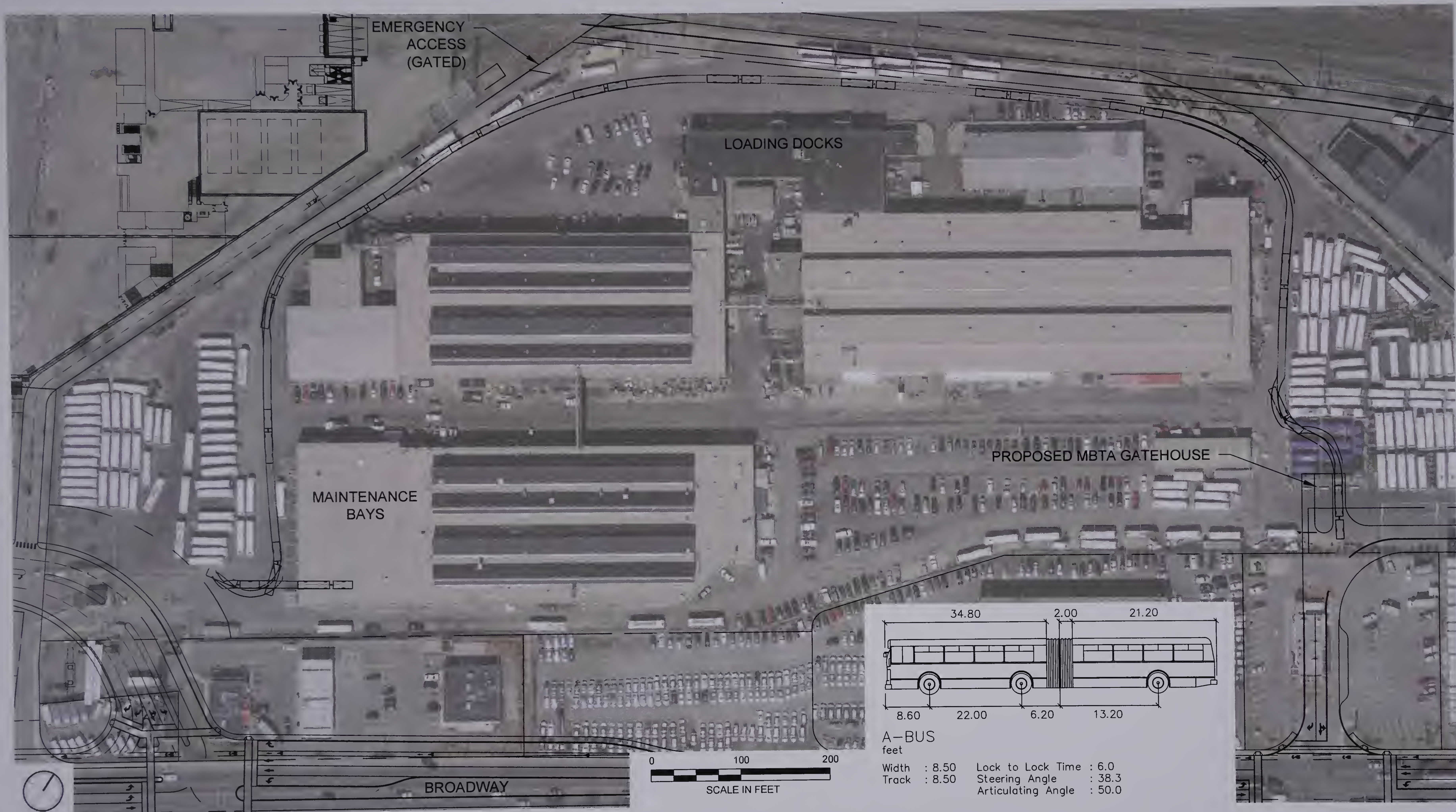
Source: Howard/Stein-Hudson Associates, Inc., 2014



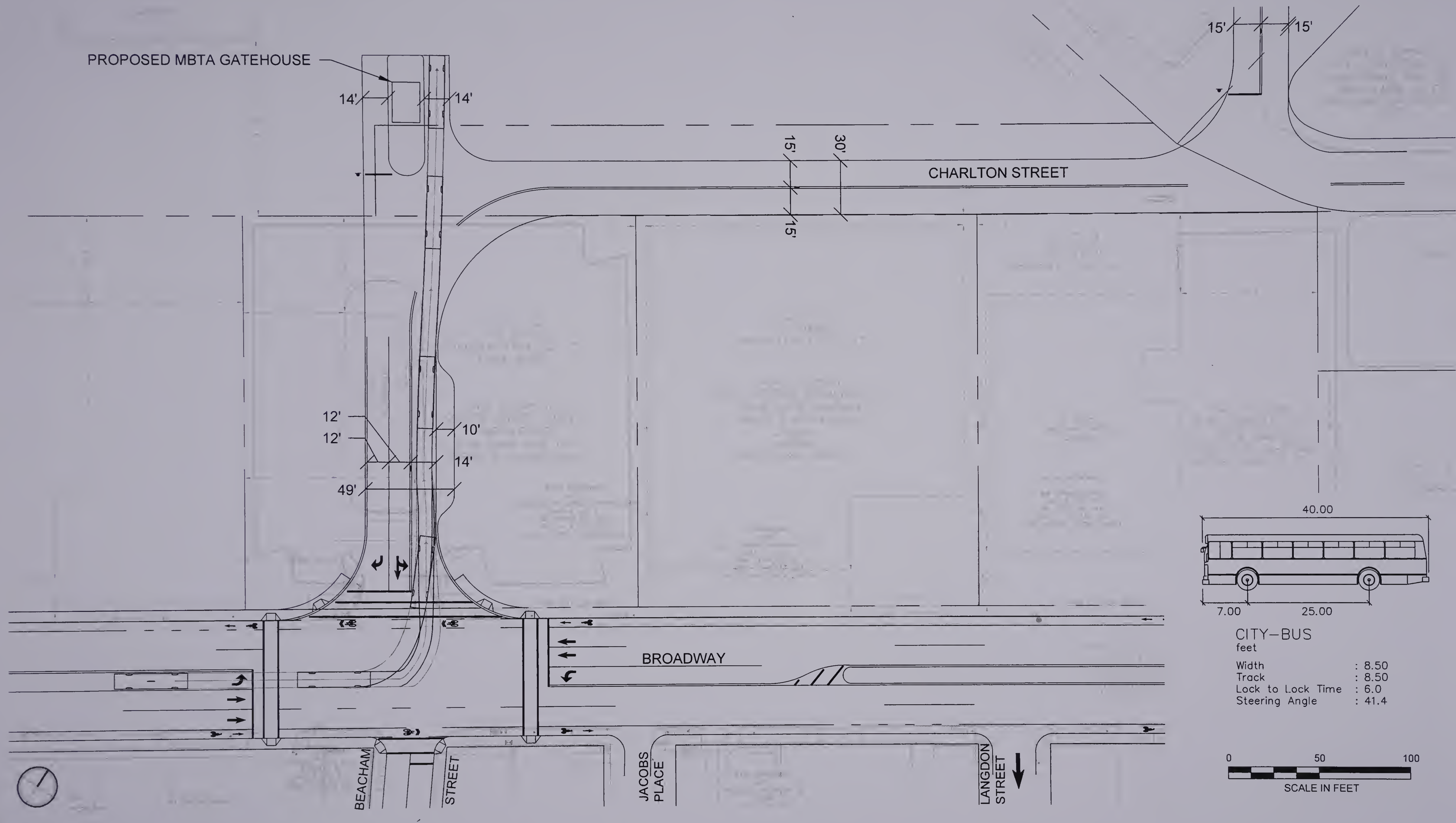
Appendix B.11D

Articulated Bus Exiting MBTA Everett Shops to South

Source: Howard/Stein-Hudson Associates, Inc., 2014



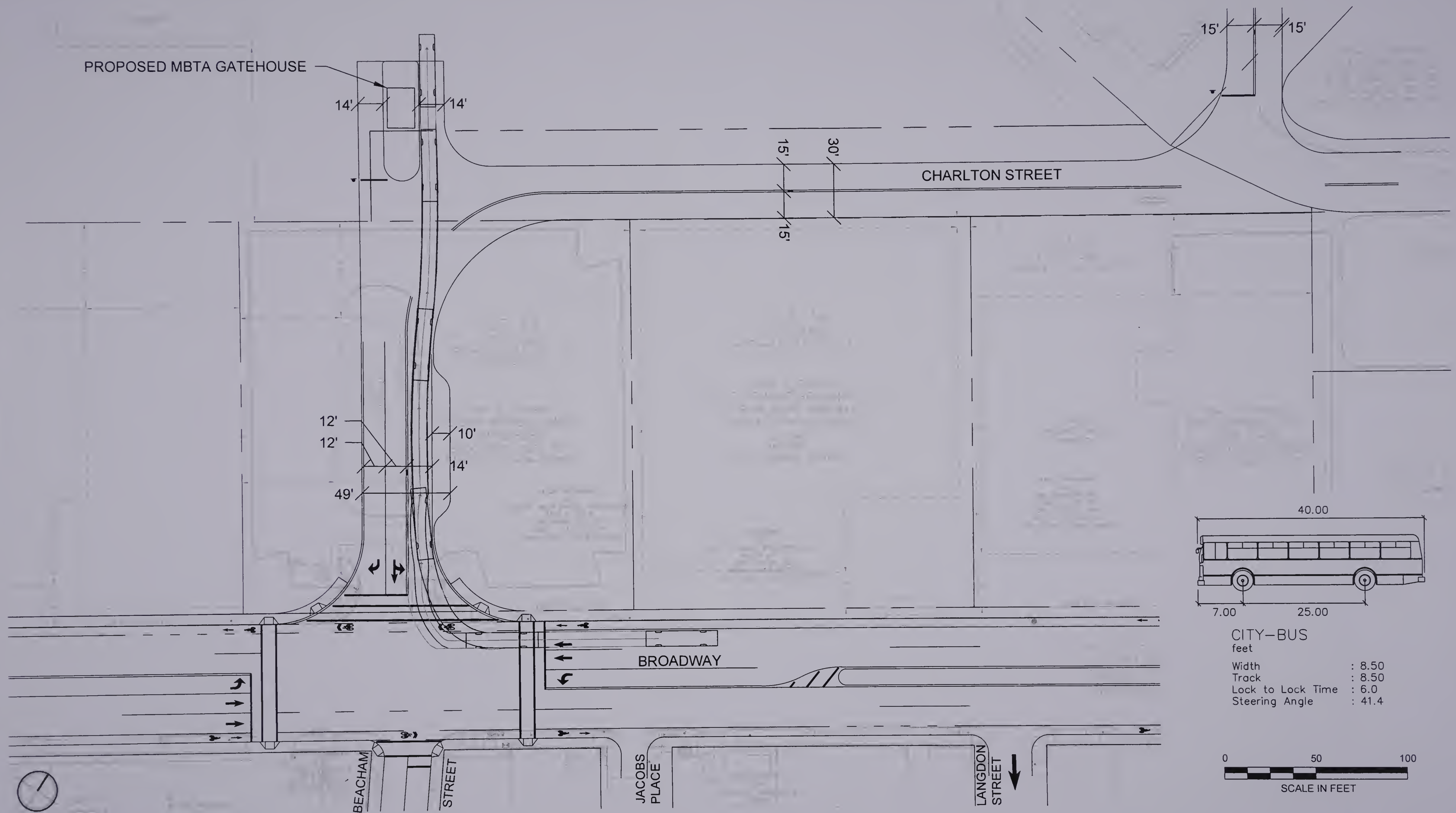
Appendix B.11E
Articulated Bus Moving through MBTA Everett Shops Site
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11F

City Bus Entering MBTA Everett Shops from South

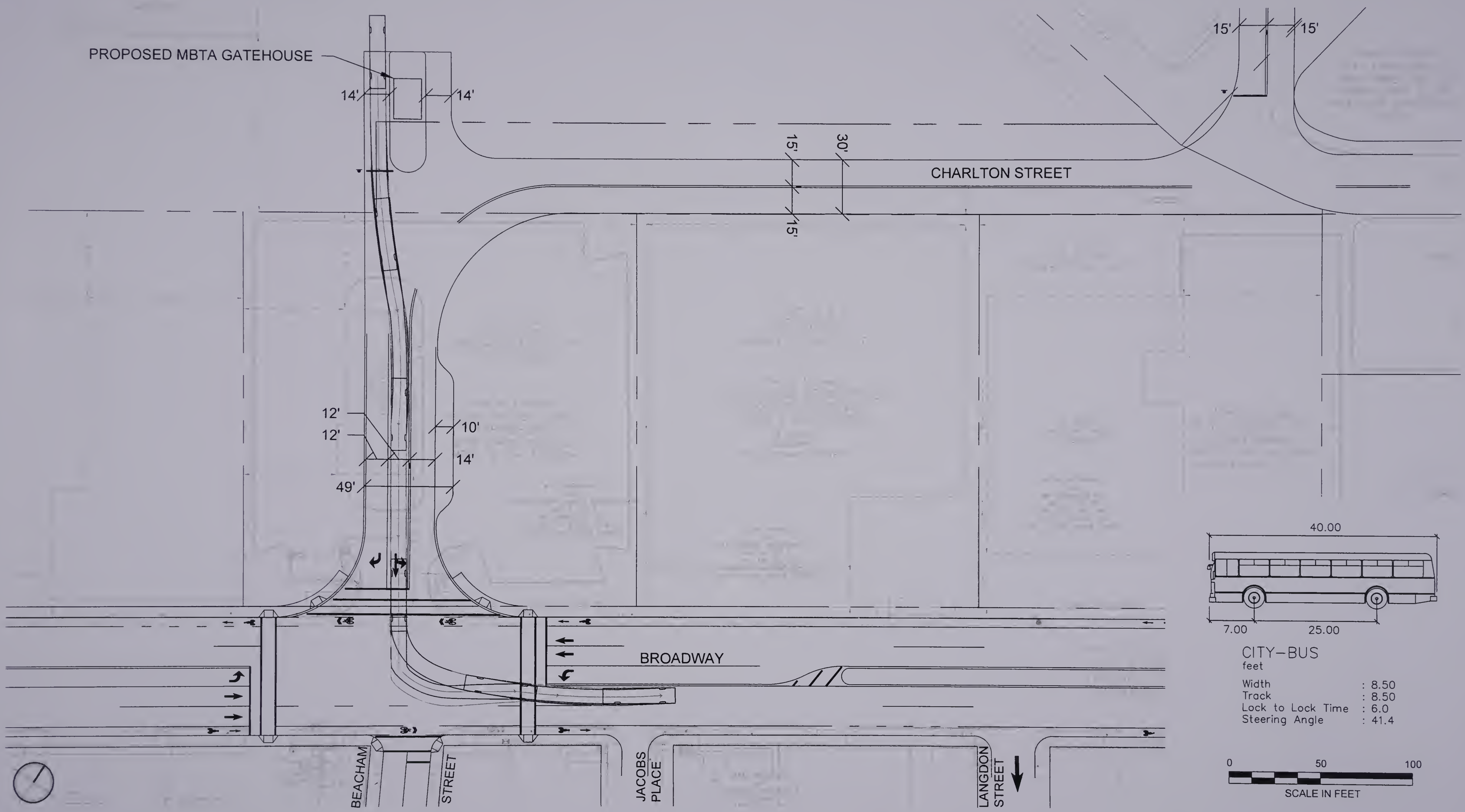
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11G

City Bus Entering MBTA Everett Shops from North

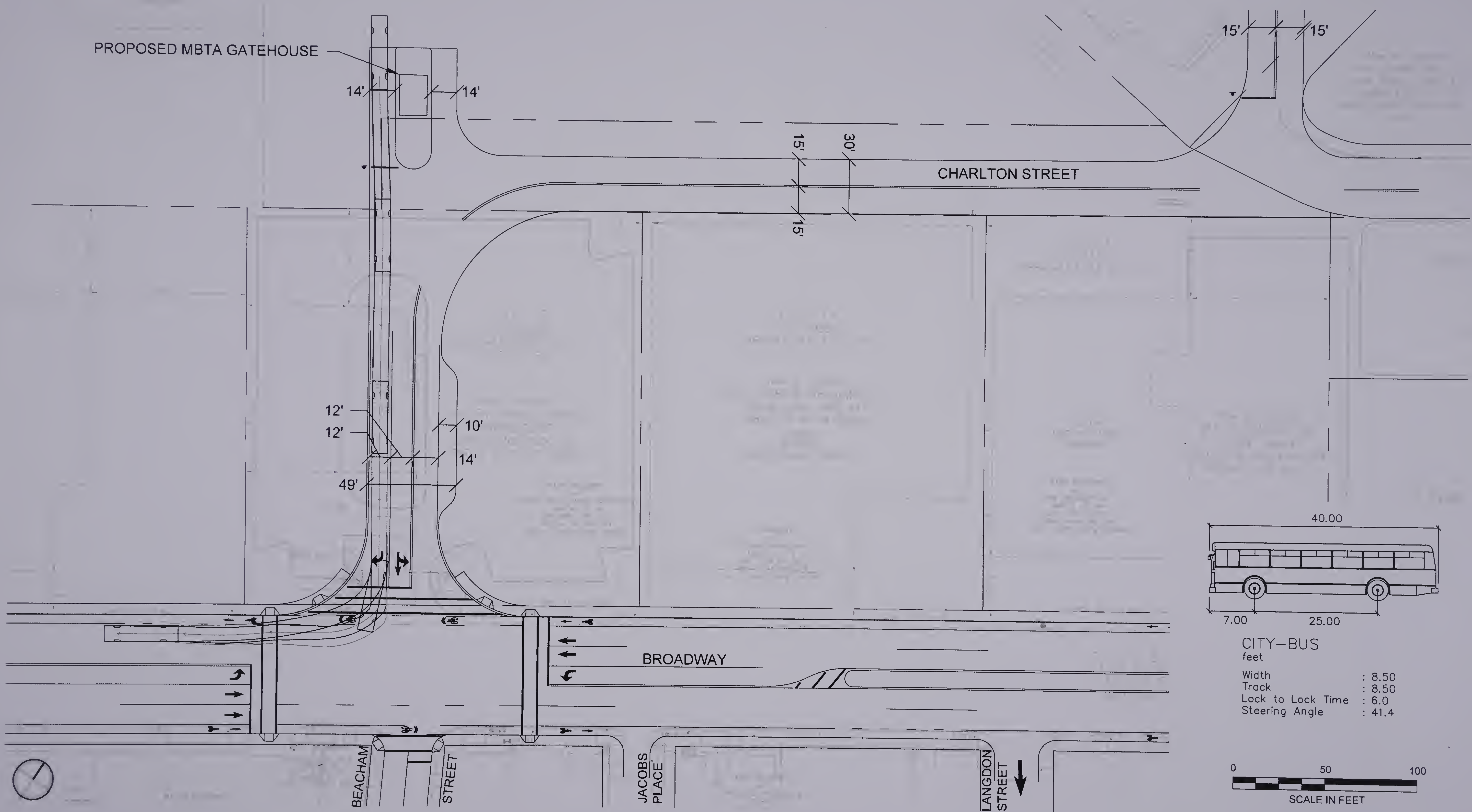
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11H

City Bus Exiting MBTA Everett Shops to North

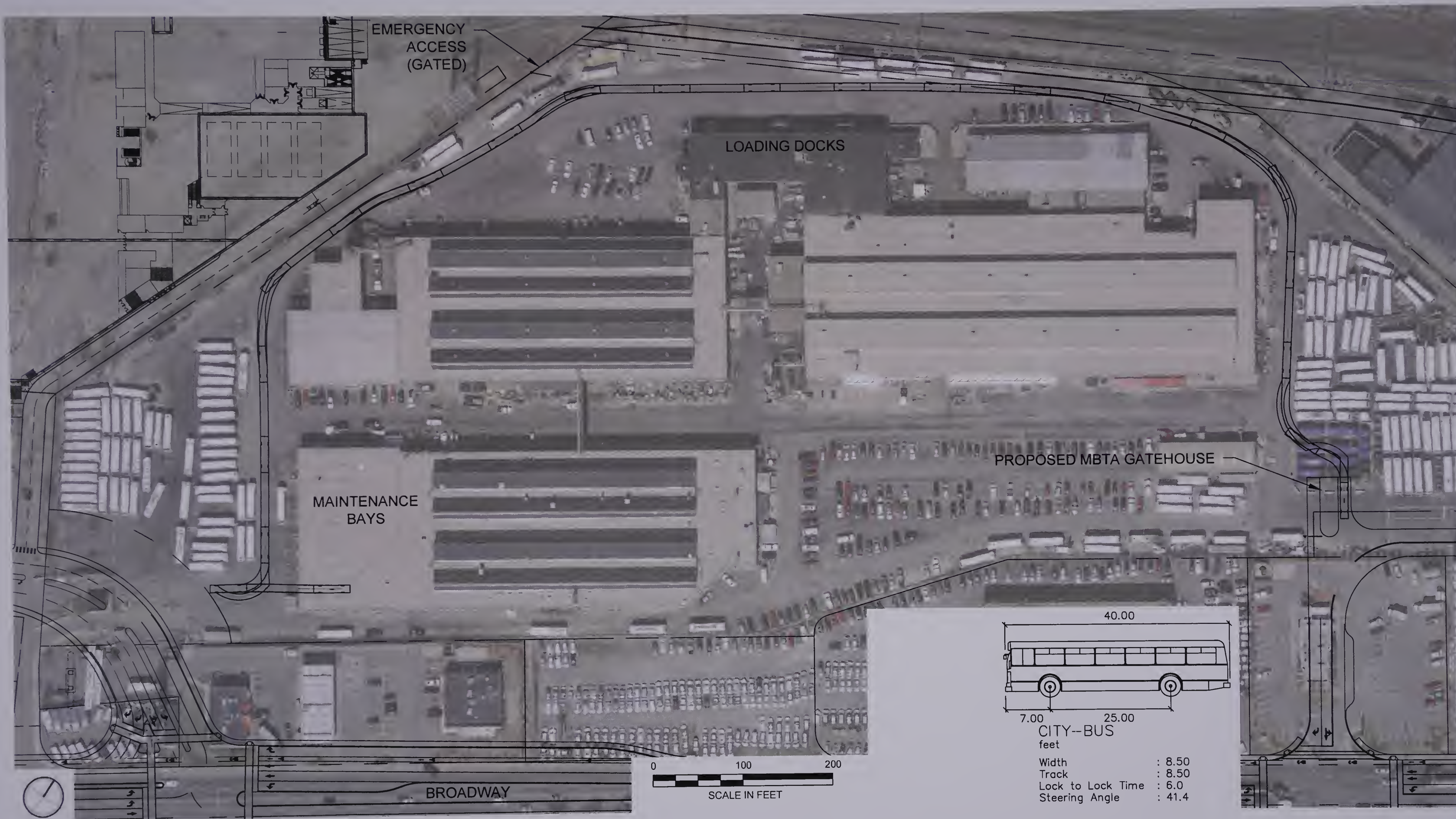
Source: Howard/Stein-Hudson Associates, Inc., 2014



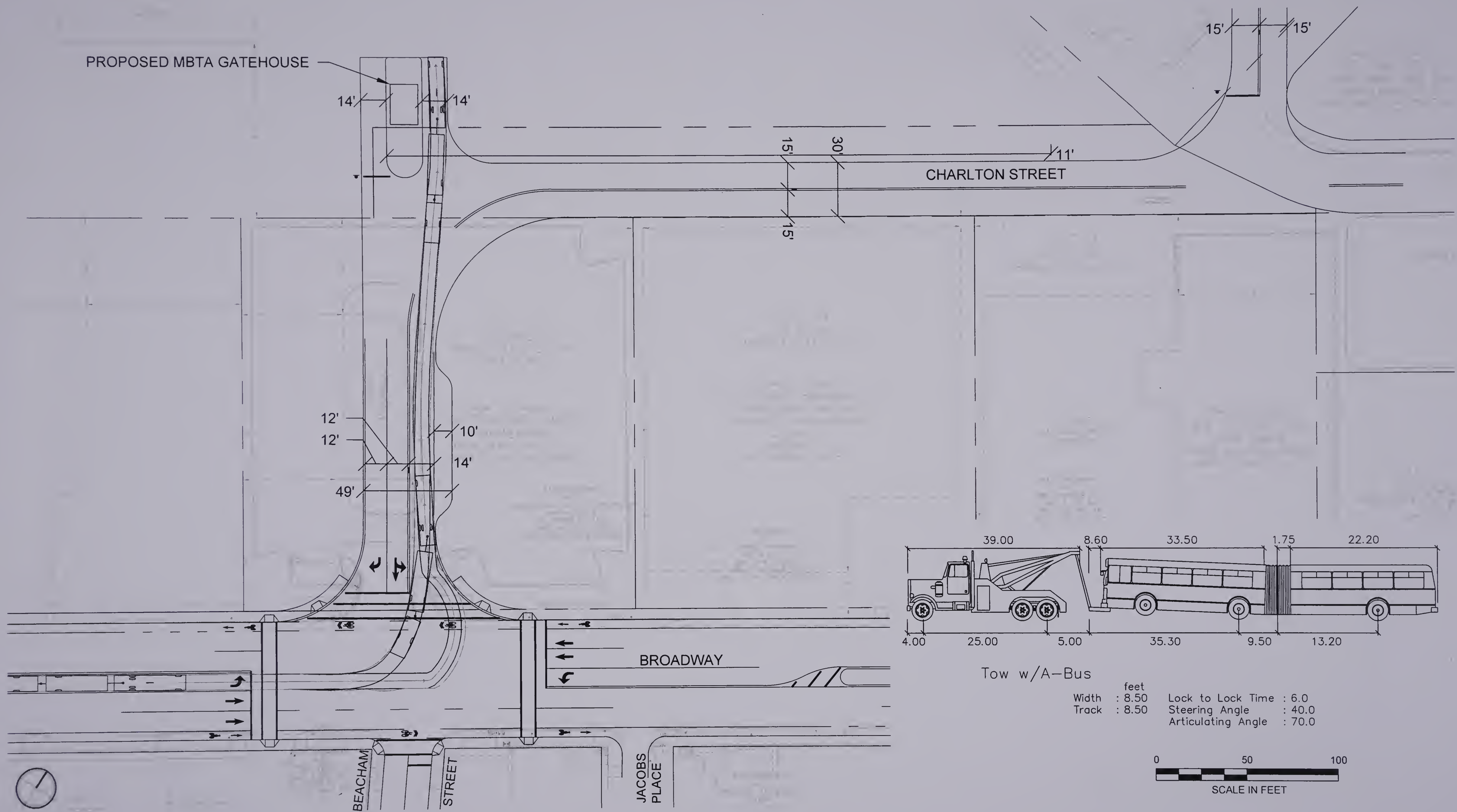
Appendix B.11I

City Bus Exiting MBTA Everett Shops to South

Source: Howard/Stein-Hudson Associates, Inc., 2014



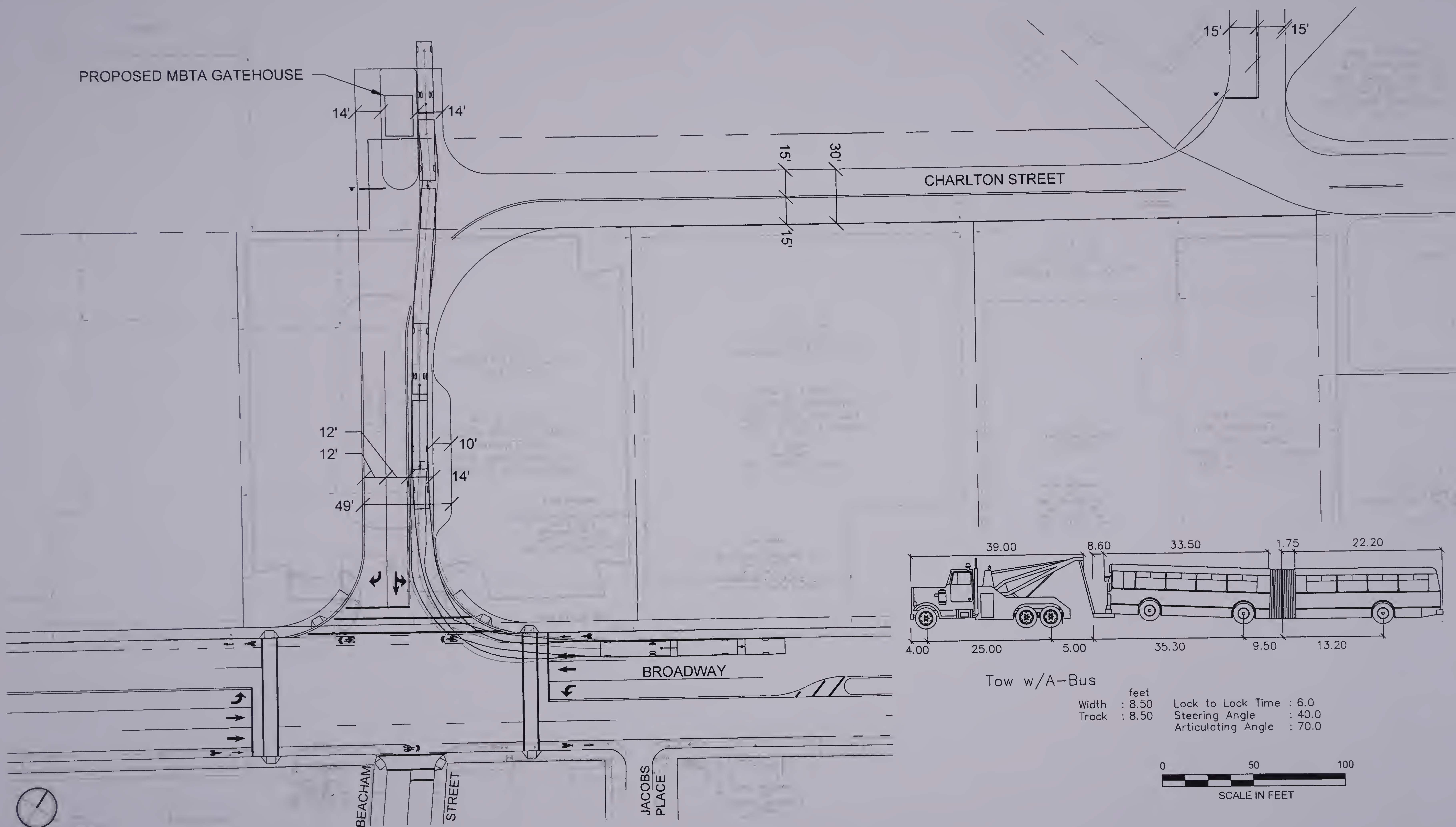
Appendix B.11J
City Bus Moving through MBTA Everett Shops Site
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11K

Tow Truck with Articulated Bus Entering MBTA Everett Shops from South

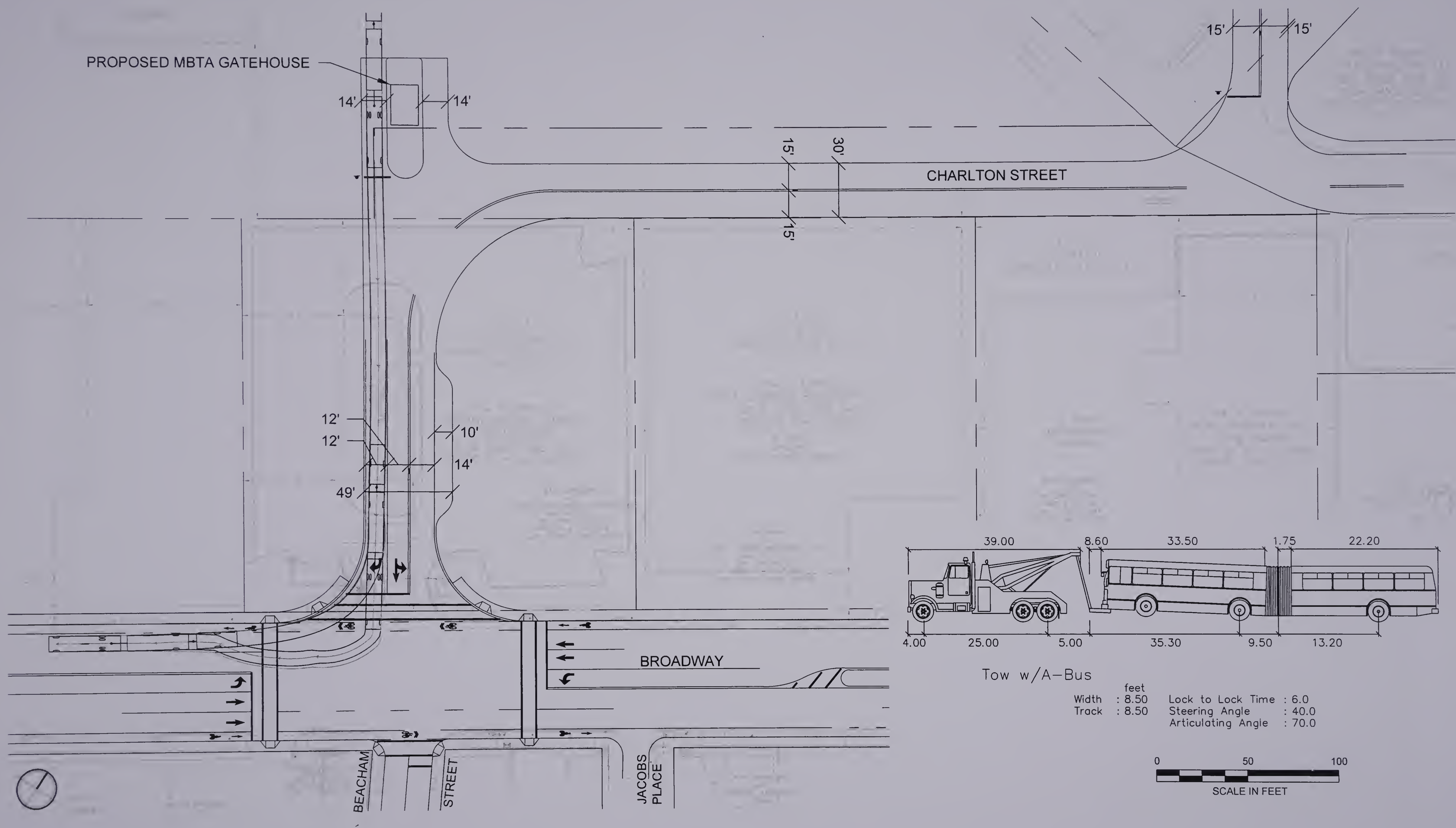
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11L

Tow Truck with Articulated Bus Entering MBTA Everett Shops from North

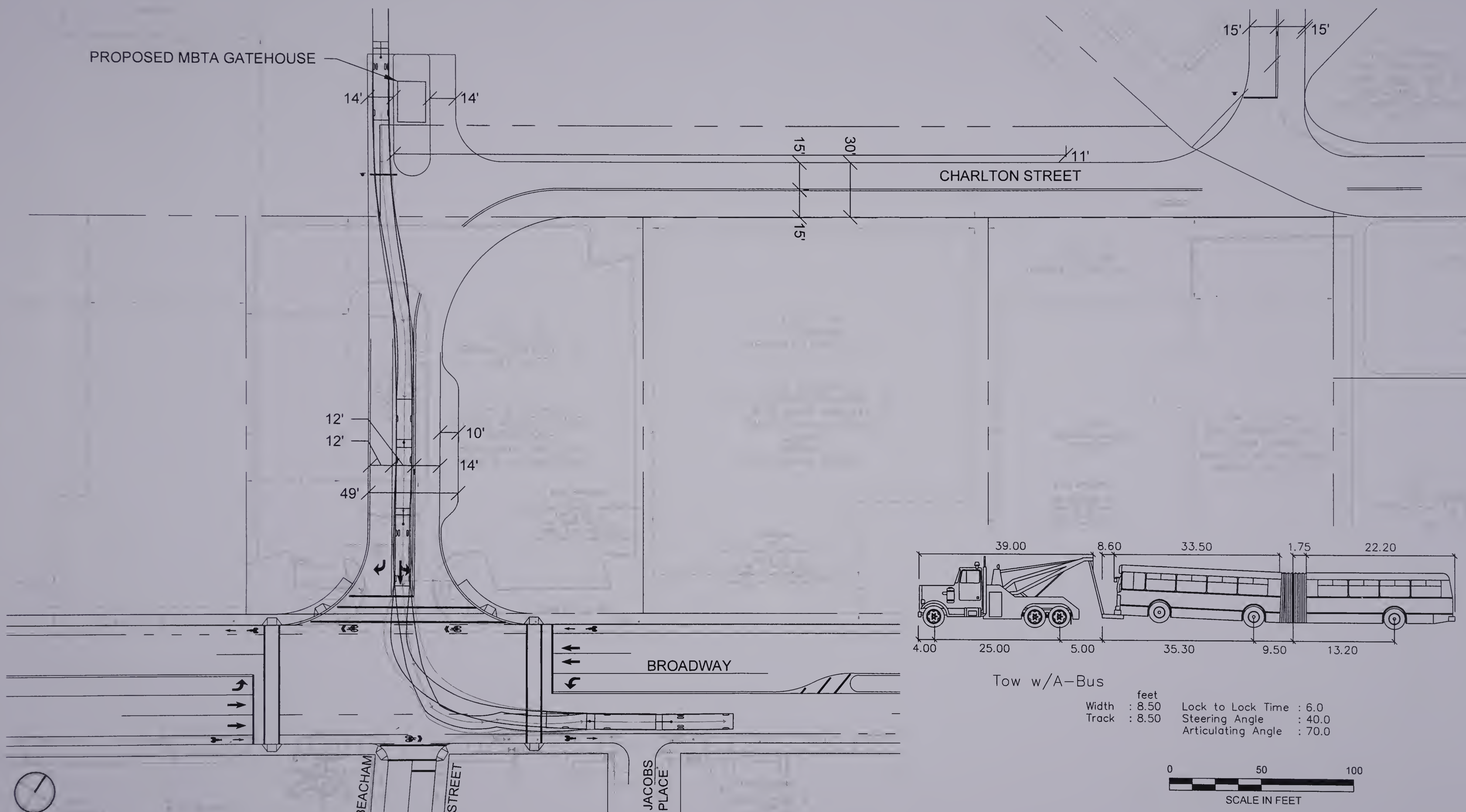
Source: Howard/Stein-Hudson Associates, Inc., 2014



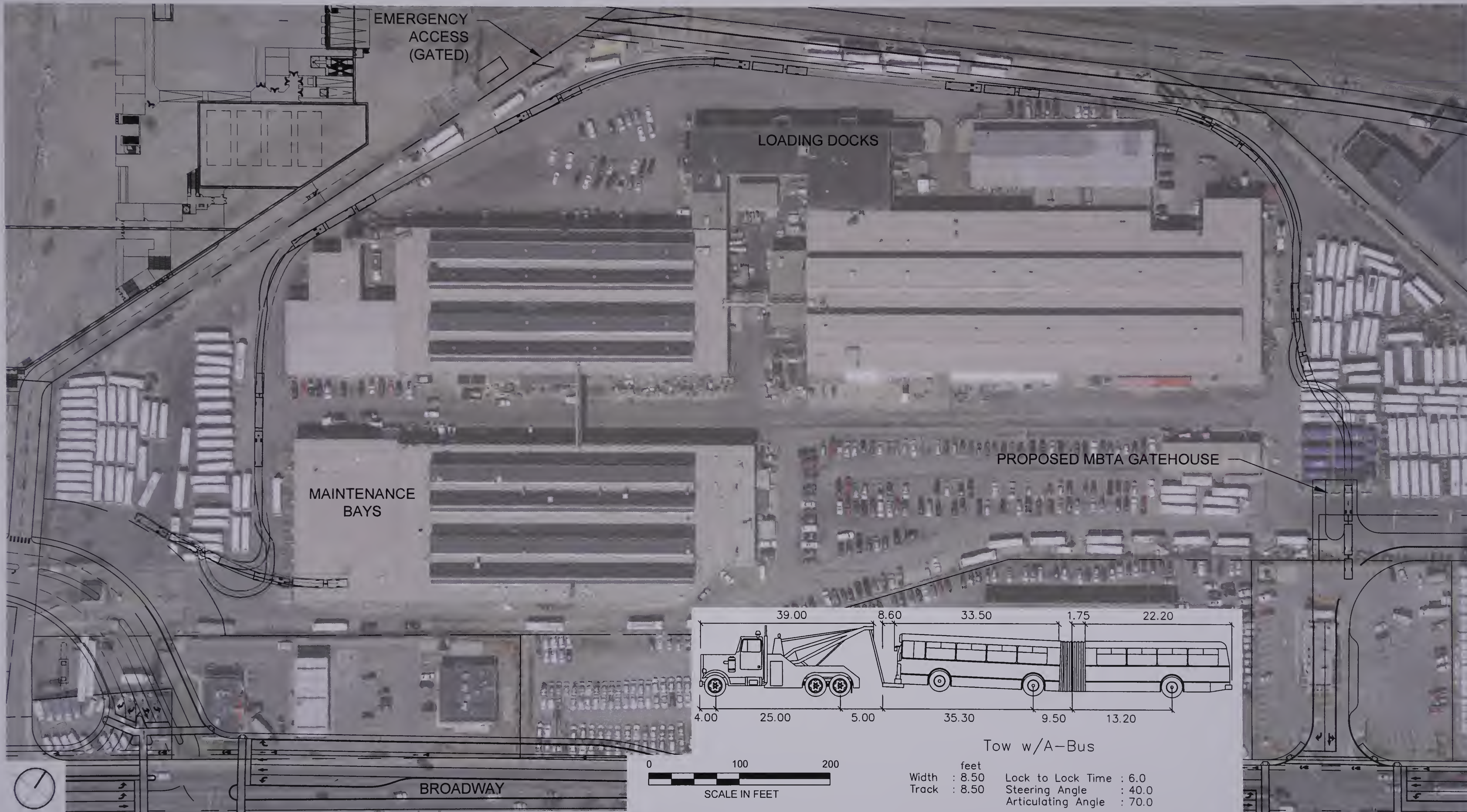
Appendix B.11M

Tow Truck with Articulated Bus Exiting MBTA Everett Shops to North

Source: Howard/Stein-Hudson Associates, Inc., 2014



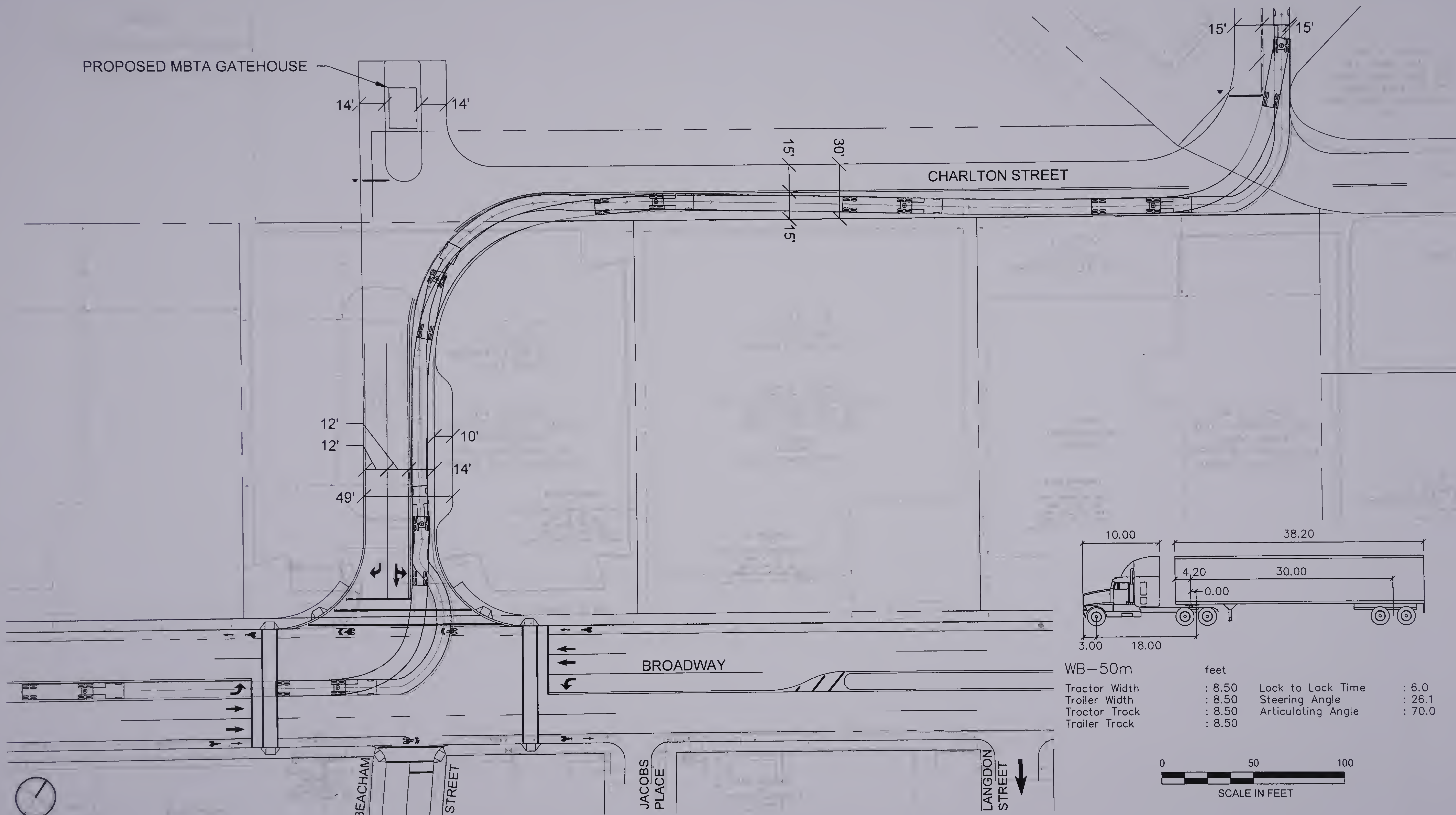
Appendix B.11N
Tow Truck with Articulated Bus Exiting MBTA Everett Shops to South
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11O

Tow Truck with Articulated Bus Moving through MBTA Everett Shops Site

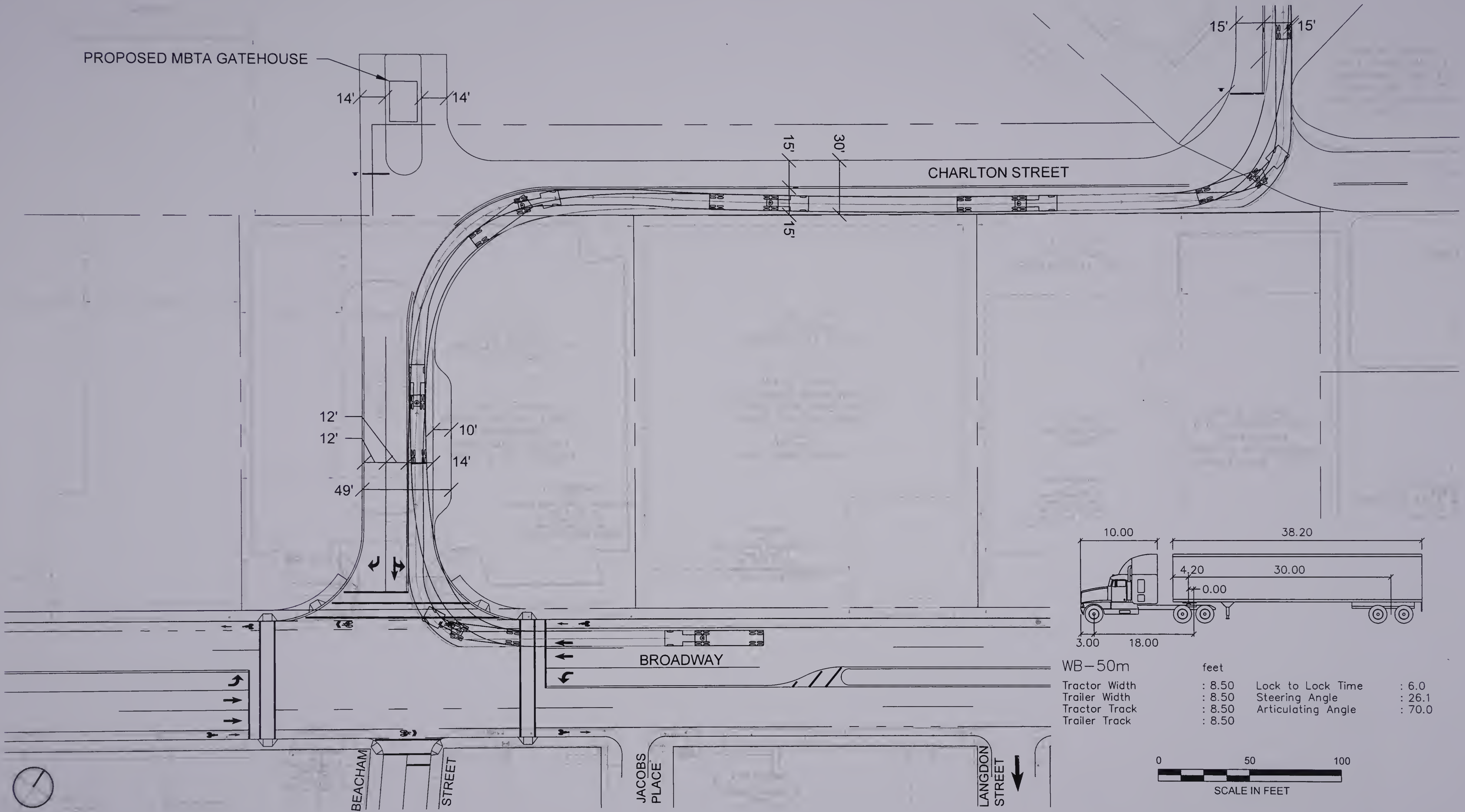
Source: Howard/Stein-Hudson Associates, Inc., 2014



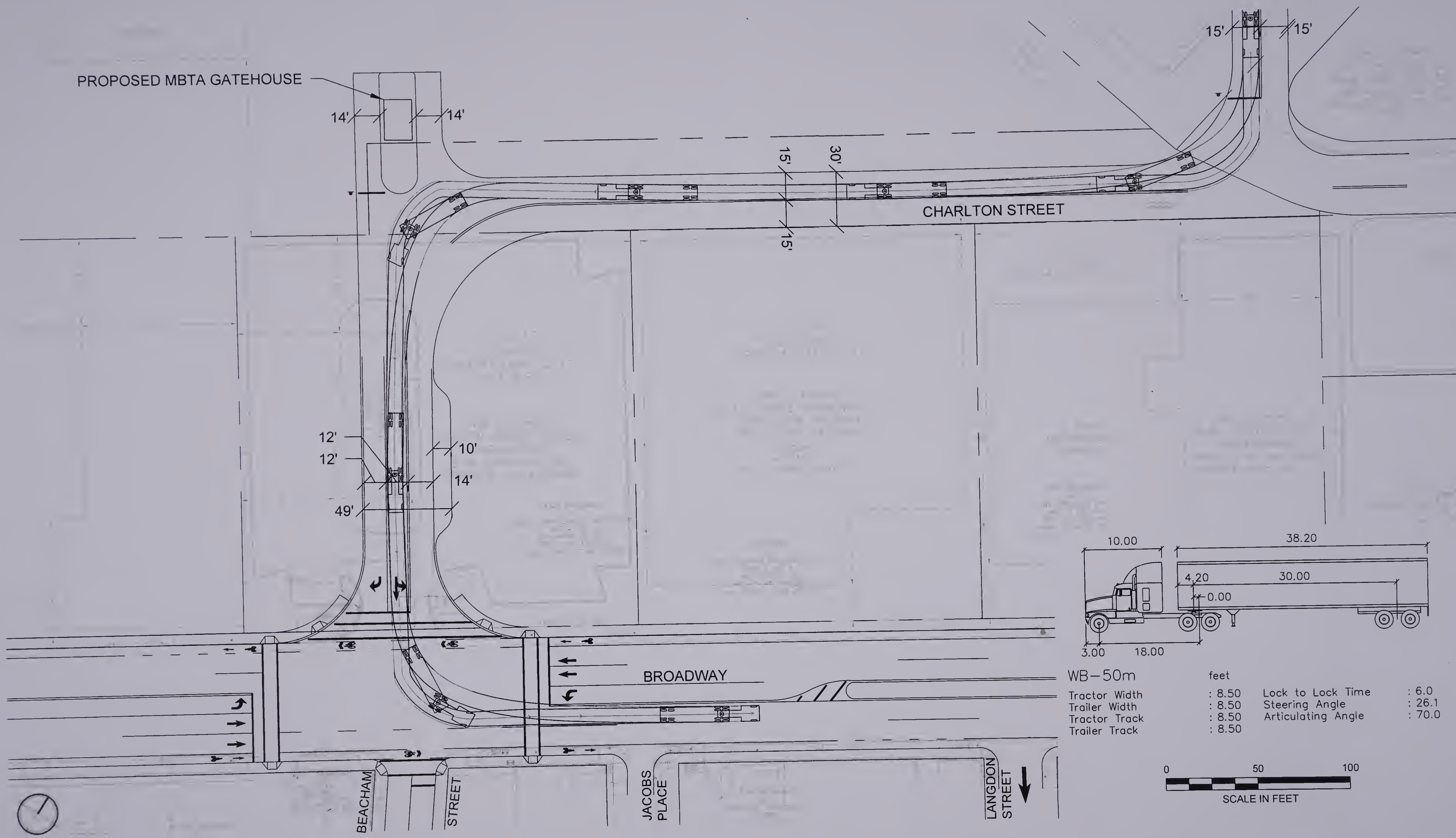
Appendix B.11P

WB-50 Tractor-trailer Entering Wynn Service Drive from South

Source: Howard/Stein-Hudson Associates, Inc., 2014



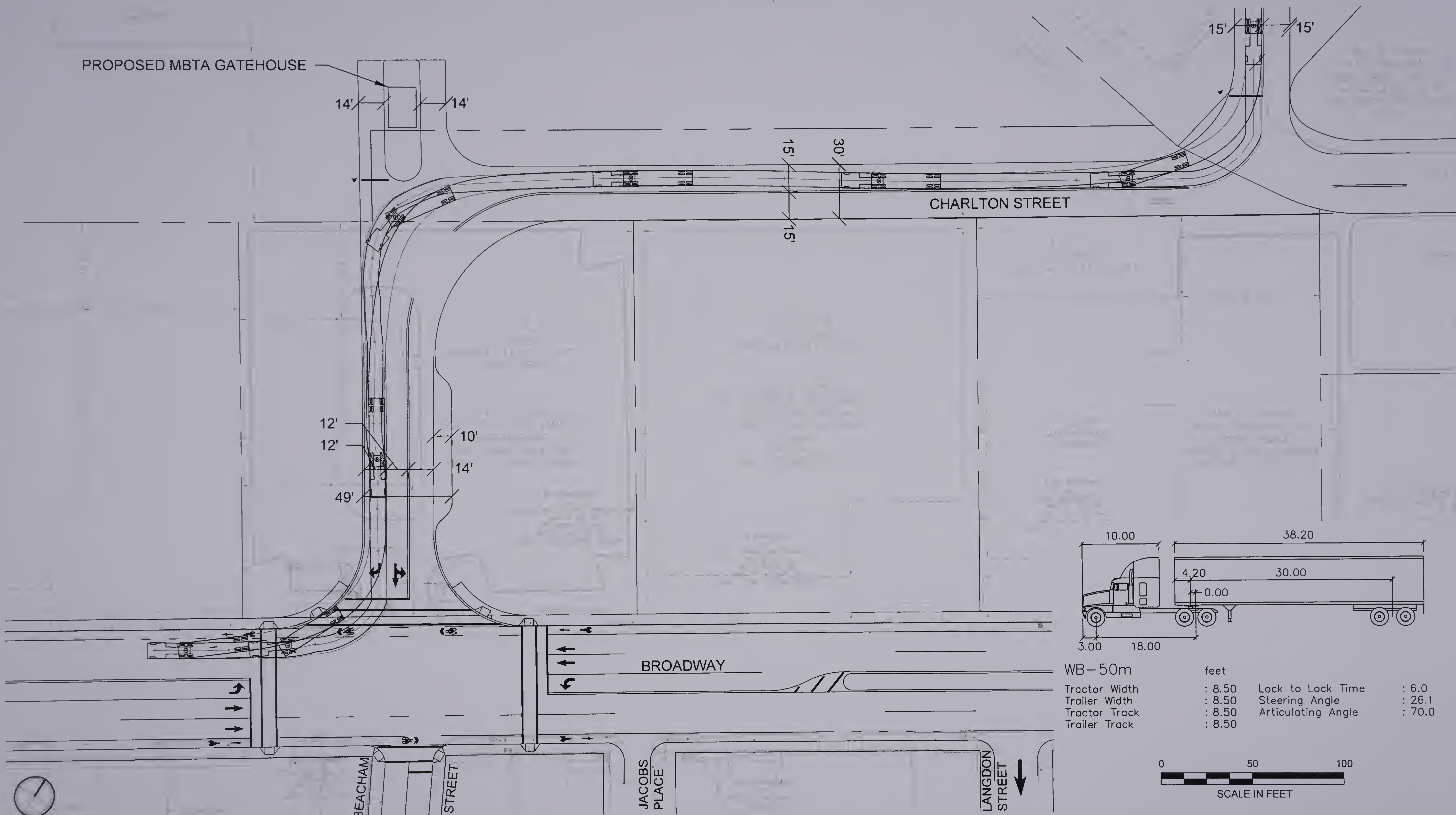
Appendix B.11Q
WB-50 Tractor-trailer Entering Wynn Service Drive from North
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11R

WB-50 Tractor-trailer Exiting Wynn Service Drive to North

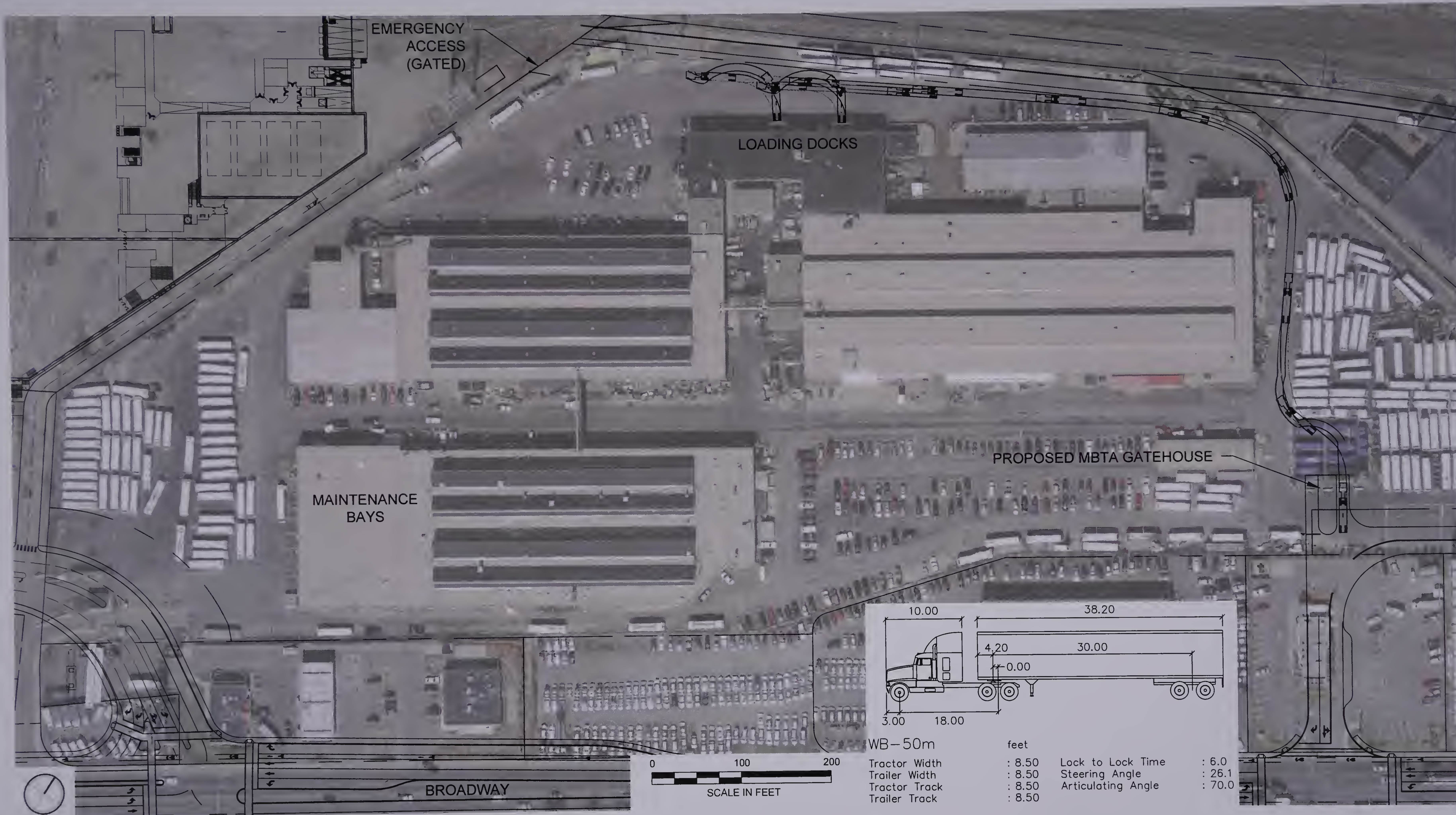
Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11S

WB-50 Tractor-trailer Exiting Wynn Service Drive to South

Source: Howard/Stein-Hudson Associates, Inc., 2014



Appendix B.11T

WB-50 Tractor-trailer Accessing MBTA Everett Shops Loading Docks

Source: Howard/Stein-Hudson Associates, Inc., 2014

Appendix C

Greenhouse Gas and Mesoscale Air Quality Analysis

GREENHOUSE GAS AND MESOSCALE AIR QUALITY ANALYSIS FOR WYNN EVERETT

COMPLIANCE WITH REVISED STRETCH CODE

November 2014

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

GREENHOUSE GAS AND MESOSCALE AIR QUALITY ANALYSIS FOR WYNN EVERETT

COMPLIANCE WITH REVISED STRETCH CODE

Prepared for:

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Prepared by:

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Revised November 13, 2014

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1.0 SUMMARY OF RESULTS

1.1 Purpose of this Report

As noted in the Secretary's FEIR Certificate[1] for Wynn Everett (the "Project"), the FEIR included a revised GHG analysis[2] consistent with the MEPA GHG Policy that evaluated CO_2 emissions for two alternatives, as required by the Policy including: 1) the Base Case corresponding top the 8th Edition of the MA Building Code (2009 IECC with MA amendments and ASHRAE 90.1-2007), and 2) the Mitigation Alternative, which includes all energy saving measures. The FEIR GHG analysis revealed the Mitigation Alternative will reduce stationary source energy use by more than 20 percent compared to the Base Case, and thus the Project complies with the 20 percent energy reduction requirement of the current Stretch Code, Section 501.1.1, and with the 20 percent energy reduction requirement of the Massachusetts Gaming Act.

On June 23, 2014, the Everett City Council voted to adopt the local-option Stretch Code for the City of Everett, effective on July 1, 2015. The Massachusetts Building Code changed on July 1, 2014 to the IECC 2012 and ASHRAE 90.1-2010 codes, and the Project building is being designed to comply with, or exceed, the requirements of the current Building Code.

In the FEIR Certificate, the Secretary states "A revised Stretch Code is expected to require energy use in new large buildings to be 12 to 15 percent below the baseline of IECC 2012."[1] As requested by the Secretary, the energy and emissions modeling has been revised using the current building code (IECC 2012 and ASHRAE 90.1-2010) as the Base Case. The results reveal energy use reduction of 18.3 percent, which is better than the 12 to 15 percent range expected by the Secretary. Thus, the results demonstrate the Project will comply with the revised Stretch Code. This supplemental analysis represents a situation where the Project applies for its building permit from the City after July 1, 2015, the date the Stretch Code takes effect in Everett.

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[1] EOEEA, "Certificate of the Secretary of Energy and Environmental Affairs on the Final Environmental Impact Report, Wynn Everett, EEA Number 15060," pages 17-18.
[2] Tech Environmental, Inc., "Greenhouse Gas and Mesoscale Air Quality Analysis for Wynn Everett, Everett, Massachusetts," June 17, 2014.

1.2 Greenhouse Gas Analysis

A revised greenhouse gas (GHG) emissions analysis was performed for Wynn Everett, consistent with the Executive Office of Energy and Environmental Affairs (EOEEA) "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010). The development consists of approximately 1.4 million square feet (sf) of conditioned space, including a high-rise hotel, an entertainment facility including a casino, convention space, restaurants, retail stores, a health club, and a Winter Garden facing south over the Mystic River. There will be separate parking structures for patrons and employees. This GHG analysis conforms to the EOEEA Policy, and the proposed Project is consistent with the Commonwealth's Sustainable Development Principles.

The GHG Policy requires a project to quantify CO_2 emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of emissions reduction and energy savings. The GHG Emissions Policy and Protocol requires quantification of GHG emissions from three sources: direct emissions from on-site stationary sources, indirect emissions from energy generated off-site (electricity), and traffic generated by the Project. CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9^{th} Edition of the MA Building Code (IECC 2012 and ASHRAE 90.1-2010), and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 4.

The following changes have been made to the GHG analysis since the FEIR analysis:

- Roof insulation is increased to R-25, wall insulation is increased to R13 + R13ci, and windows have double low-e glass with a lower U value of 0.38.
- Indoor and outdoor light power density values for the Base Case are revised to match the IECC 2012 Code.
- Minor changes to the building program that do not significantly change the total conditioned space.

Per the rules of the 2010 ASHRAE 90.1-2010 Appendix G (Performance Method), Table G3.1.1B, the baseline heating source was assumed to be a gas-fired hot-water boiler since cogeneration (CHP) cannot be included in the baseline model. As there is no Appendix G plug load value for a casino, the plug load values from the FEIR GHG analysis were used in the current study.

Wynn Everett has adopted the following Renewable Energy Measures:

- Photo-voltaic (PV) system on the roof of the podium building, hotel tower or parking garage, providing approximately 3% of the Project's annual electrical consumption.
- Purchase of approximately 7% of the Project's annual electrical consumption from local service providers of Green Power.
- Cogeneration plant (CHP) using a nominal 1-MW microturbine, providing approximately 20% of the Project's annual electrical consumption. The cogeneration plant is capable of providing 6,307 MWhr/year of on-site electrical generation, supporting 780 tons of absorption cooling, and providing up to 50 percent of the Project's annual heating and hot water needs.

The feasibility of alternative and renewable energy sources to be incorporated into the Project is examined in Section 4.4. These include:

- An on-site anaerobic digester for food waste.
- Ground or water-source heat pumps for the hotel high-rise tower.

The EEMs presented above constitute the Mitigation Alternative and will reduce total direct and indirect stationary source <u>CO_2 emissions</u> by 27.4% compared to the Base Case. The combination of intersection improvements to reduce vehicle idling and Transportation Demand Management (TDM) measures to reduce trips will reduce Project-related motor vehicle CO_2 emissions by 13.0%. The net reduction of the Project's total CO_2 emissions (stationary source, plus transportation) is 25.7% compared to the Base Case.

The Mitigation Alternative reduces the Project building <u>energy use</u> by 18.3% (see energy use in Tables 4A and 4B)[3]. If the energy used for parking garage lighting, garage ventilation, and potable water and wastewater treatment are included in the totals, the Mitigation Alternative reduces Project building energy use by 26.4% (see energy use listed below Table 4F). The lower of these two figures is used in judging compliance with a revised Stretch Code: a reduction of 18.3% below the 2012 IECC Base Case is better than the 12-15% range expected by the Secretary.

[3] Base Case energy use is [37,965.6 MWhr/yr x 3.412 MMBtu/MWhr] + 49,513.4 MMBtu of natural gas/yr = 179,052.0 MMBtu. Mitigation Case energy use is [30,917.3 MWhr/yr x 3.412 MMBtu/MWhr] + 40,863.7 MMBtu of natural gas/yr = 146,353.5 MMBtu. The reduction is 18.3%.

1.3 Section 61 Findings

Wynn Everett commits to the comprehensive list of energy efficiency measures (EEMs) in the Mitigation Alternative that will reduce overall Project (stationary source) CO_2 emissions by 27.4%, compared to the Base Case, but retains the flexibility to achieve this GHG emission reduction goal using EEMs to be refined at the time of detailed design.

Wynn Everett also commits to the Renewable Energy Measures listed above. The proposed rooftop PV system and the 1-MW microturbine cogeneration plant together are estimated to reduce CO_2 emissions by 334 + 212 = 546 tons/year, an additional 2.7% reduction from Base Case CO_2 emissions.

At the completion of construction, the Proponent will provide a certification to the MEPA Office, signed by an appropriate professional, identifying either: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures that together are designed to achieve the same percentage reduction in GHG emissions as the Mitigation Alternative, based on the same modeling assumptions used in this analysis, have been adopted.

2.0 PROJECT MESOSCALE AIR QUALITY ANALYSIS

No changes have been made to the mesoscale air quality analysis since the FEIR. This is a conservative assumption since the minor changes in the building program since the FEIR result in slightly lower peak hour vehicle trips. This section, identical to that in the FEIR GHG report, is included for completeness.

The mesoscale air quality analysis was performed to calculate the potential regional air quality effect of the proposed project, using as a measure the total daily emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) in the study area following the latest Massachusetts DEP guidance[4]. Specifically, calculations were performed to compare areawide VOC and NO_x emissions after the project is built with existing and future no-build emissions.

The entire Commonwealth of Massachusetts was classified by the US EPA as a "serious" ozone non-attainment area with regard to the old one-hour ozone standard. Massachusetts was required by the 1990 Clean Air Act Amendments to reduce VOC emissions until attainment of the one-hour Massachusetts and National Ambient Air Quality Standard (NAAQS) for ozone is reached. The Commonwealth developed a State Implementation Plan (SIP) for ozone that showed how these reductions would be achieved. Air monitoring showed that compliance with the one-hour ozone standard has been achieved in most of Massachusetts.

In 1997, the U.S. EPA established a new eight-hour NAAQS for ozone. In April of 2004, the U.S. EPA designated eastern Massachusetts as a moderate nonattainment area with respect to the new eight-hour ozone NAAQS. The U.S. EPA revoked the one-hour ozone standard nationwide in 2005, as part of the implementation of the eight-hour ozone NAAQS. The Commonwealth submitted the required final ozone SIP to the U.S. EPA on January 31, 2008, demonstrating compliance with the 8-hour ozone NAAQS. On March 12, 2008, the U.S. EPA revised the 8-hour ozone standard by reducing it from 0.08 parts of ozone per million parts of air (ppm) to 0.075 ppm. The U.S. EPA issued final attainment status designations regarding the new standard on June 28, 2012. In January

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[4]Massachusetts DEP, Guidelines for Performing Mesoscale Analysis of Indirect Sources, Division of Air Quality Control, May 1991.

2010, U.S. EPA proposed to lower the standard to a level between 0.060 ppm to 0.070 ppm. On September 2, 2011, the Obama administration delayed signing a final rule on the reconsideration of the 2008 Ozone standard until 2013, which likely delay the final attainment designations.

Ozone concentrations in the study area are made up of three parts: 1) natural ozone; 2) locally generated ozone; and 3) ozone transported from upwind urban areas. Emissions of VOC and NO_x in the study area have almost no effect on local ozone levels due to their relatively small size and the fact that photochemical reaction times are not rapid enough to form ozone until a parcel of air has been transported a long distance downwind. VOC and NO_x emissions from the urban areas south and west of Massachusetts are the primary determinants of ozone levels in the study area. The VOC and NO_x emissions from the study area are insignificant when compared to emissions from the entire region and urban areas upwind (such as Springfield, Hartford, and New York City). Effective ozone control measures are national programs such as those setting motor vehicle emission standards and controls on large fuel-burning sources (electric utility plants and industrial boilers).

2.1 Mesoscale Study Area

The mesoscale study area was conservatively defined to include the entire EENF traffic study area. It is includes the following roadway segments:

- Main Street Connectors to Sweetser Circle
- Route 99 Connectors to Sweetser Circle
- Route 16 Connectors to Sweetser Circle
- Route 99 between Sweetser Circle & Bowdon Street
- Sweetser Circle
- Route 16 W Off Ramp to Sweetser Circle
- Route 99 between Sweetser and Santilli Circles
- Route 16 Santilli Circle Connectors through Sweetser Circle
- Santilli Circle
- Rt 16 within Santilli Circle
- Santilli Highway to Santilli Circle Connectors
- Route 16 West Bound Connector
- Route 16 East Bound Connector to Santilli Circle
- Route 16 East Bound to Mystic View Road
- Mystic View Road to Santilli Circle Connectors
- Route 99 between Beacham Street and Horizon Way
- Route 99 to Sullivan Square Connectors

- Main Street (Route 38) to Sullivan Square Connector
- Maffa Way to Sullivan Square Connector
- Cambridge Street to Sullivan Square Connector
- Rutherford Avenue to Sullivan Square Connectors
- Main Street to Sullivan Square Connectors
- Sullivan Square
- Beacham Street to Route 99

2.2 Mesoscale Analysis Procedure

The mesoscale analysis calculated emissions of VOC and NO_x over the study area for four scenarios:

- 2013 Existing
- 2023 No-Build
- 2023 Build
- 2023 Build with Mitigation.

The MOBILE6.2 model was run using inputs that follow the latest MassDEP guidance with input files provided by MassDEP (see Appendix B). The MOBILE6.2 input files allow credit to be taken for an enhanced motor vehicle inspection and maintenance (I/M) program with Massachusetts specific I/M cutpoints, Stage II (refueling) emission controls, and reformulated gasoline. The emission factors for CO were conservatively calculated for cold wintertime temperatures, which correspond with the peak CO motor vehicle emission rates. The emission factors for VOC and NOx, were calculated for the warm summertime temperatures, which correspond with both the peak ozone season and the peak motor vehicle emission rates for these pollutants.

2.2.1 <u>Moving Vehicle Emissions</u>

The vehicle miles traveled (VMT) for each roadway segment was calculated by multiplying the length of each road segment by the average daily traffic volume on the segment. Average daily (24-hour average) traffic volumes (ADTs) were calculated based on traffic data provided by Howard/Stein-Hudson (HSH); the calculations are shown in Appendix B. The VOC and NO_x emissions for free-flowing traffic on each roadway segment were calculated by multiplying the VMT (miles per day) by the MOBILE6.2 predicted VOC and NO_x emission factors in grams per mile. The MOBILE6.2 model was run using input files provided by the MassDEP for 2013 and

2023. These emission factors were calculated for the warm summertime temperatures, which correspond with the peak ozone season. MOBILE6.2 predicted VOC and NO_x emission factors vary with vehicle speed. Average speeds were assumed to range from 15 to 30 mph within the roadway network. Tables B-2 through B-4, in Appendix B, show the emission calculation spreadsheets for the Existing, No-Build, Build and Build with Mitigation scenarios. Tables 1 and 2 summarize the moving vehicle emissions for each air pollutant, for each case.

2.2.2 Idling Vehicle Emissions

Idling emissions for the four modeling scenarios were calculated using MOBILE6.2 idling emissions factors for 2013 and 2023 and predicted vehicle traffic volumes and delay times for each traffic movement at 23 intersections. The intersections were selected based on the projected level of service (LOS) of E or F for the 2023 Build scenario (See Appendix B). Tables B-5 through B-7, in Appendix B, shows the idling emissions calculations. Tables 1 and 2 summarize the idling vehicle emissions for each air pollutant, for each scenario.

2.3 Predicted Project Impacts

A summary of the results of the mesoscale analysis is presented in Tables 1 and 2. In Table 1, the 2013 Existing VOC mesoscale emissions over the study area are 60.5 kg/day. The mesoscale emissions of VOC for the 2023 No-Build case are predicted to be 74.3 kg/day. This is a 22.9% increase from the existing mesoscale VOC emissions. The mesoscale emissions of VOC for the 2023 Build case are predicted to be 84.3 kg/day. Table 2 shows that the 2013 Existing NO_x mesoscale emissions over the study area are 68.1 kg/day. The mesoscale emissions of NO_x for the 2023 No-Build case are predicted to be 36.8 kg/day. This is a 46.1% decrease from the existing mesoscale NO_x emissions. The mesoscale emissions of NO_x for the 2023 Build case are predicted to be 40.6 kg/day.

The US EPA has established more-strict emission standards for new motor vehicles than older vehicles. The MOBILE6.2 model predicts motor vehicle VOC and NO_x emission rates to decrease between 2013 and 2023, as new, lower polluting vehicles replace older vehicles on the roadways.

The MOBILE6.2 model predicts further declines in VOC and NO_x motor vehicle emission rates after 2023. These national control programs are the most effective mitigation measures for ozone, a regional air pollutant. While each individual project needs to pursue all reasonable mitigation measures for motor vehicle emissions, the net effect of a single project is very small.

While both VOC and NO_x emission rates decline from 2013 to 2023, the mesoscale analysis results listed above reveal that project area VOC emissions for the 2023 No-Build case will increase by 22.9% from 2013 Existing values, while project area NO_x emissions for the 2023 No-Build case will decrease by 46.1%. This is due to the interplay between two effects: (1) No-Build condition traffic volumes and idling times at intersections in the project area will increase in the ten years from 2013 to 2023; and (2) In this same ten year period, the NO_x emissions from a single vehicle will decline more than twice as much on a percentage basis as the VOC emissions. The decline in the NO_x emission rate is greater than the growth in traffic volumes/idling times and thus the mesoscale emissions for NO_x decrease from 2013 to 2023 for the No-Build case. The decline in the VOC emission rate, however, is less than the growth in traffic volumes/idling times and as a result the mesoscale emissions for VOC increase from 2013 to 2023

2.4 Measures to Mitigate Air Quality Impacts

The mesoscale analysis results show that the VOC emissions for the 2023 Build are predicted to be 84.3 kg/day, 13.5% higher than those for the 2023 No-Build case. The VOC emissions from the Project are 10.0 kg/day. Compared to countywide VOC emissions of approximately 136,586 kg/summer day, this represents an increase of less than 0.001%. NO_x emissions for the 2023 Build case are predicted to be 40.6 kg/day, 10.3% higher than those for the 2023 No-Build case. The NO_x emissions from the Project are 3.8 kg/day. Compared to countywide NO_x emissions of approximately 132,213 kg/summer day, this represents an increase of less than 0.001%.

Wynn Everett will implement all reasonable and feasible mitigation measures to reduce traffic-related air quality impacts, discussed below. These mitigation measures include:

- Roadway improvements at key intersections to reduce vehicle delay times.
- Transportation Demand Management (TDM) measures.

These same measures are used to calculate emissions reductions for the transportation portion of the greenhouse gas emissions mitigation analysis presented in Section 3.

Intersection Roadway Improvements

Wynn Everett will implement intersection improvements to increase traffic flow and reduce idling times and emissions. The following intersections, included in the idling emissions calculations, are proposed to be improved as part of the Project:

- Beacham Street/Broadway (Route 99)
- Ferry Street/Broadway (Route 99)
- Revere Beach Parkway (Route 16)/Washington Street
- Bell Circle – East Intersection

Intersection improvements will include adjusting signal timing and adjusting phasing splits at intersections.

Transportation Demand Management

Wynn Everett will implement the following Transportation Demand Management (TDM) strategies, which are described in greater detail in Section 4.5.4 of the FEIR, and these TDMs will reduce overall vehicle emissions by 2%, as discussed below.

- ***Locate New Buildings Near Transit***– The Project site is ideally situated to take advantage of available public transportation resources in the area. MBTA bus stops will be provided aklong Lower Broadway at the primary driveway. Fixed-route shuttle bus service will be provided to and from the Project Site and the MBTA Orange Line stations at Wellington Station and at Sullivan Square. Water shuttle service to the Project Site would be provided through a private service at a dock built as part of the Project. In addition, the Project proponent will explore with the City and the MBTA provision of a stop on the MBTA Commuter Rail system to serve both the City and the Project.

- ***Preferential Parking*** –The Project will designate preferential parking spaces in the employee garage for employees that use carpools, vanpools or alternatively-fueled vehicles.

- ***Pedestrian and Bicycle Access*** –The City/DCR park and pathway system will be extended to the Project site to allow pedestrian and bicycle access to and from Wellington Station on the MBTA Orange Line. The Project will provide bicycle racks or storage areas within the secure parking garage for use by resort guests and employees.

- ***Transportation Coordinator*** – A full-time Transportation Coordinator will be assigned for the Project to promote use of public transportation, encourage employees to participate in MassRIDES' NuRide program, and to provide maps, schedules and fare information.

- ***On-Site Amenities*** – The Project will include an ATM and several restaurants, providing employees on-site food services.

- ***EV Charging Stations and Zip-Car*** – The Project will provide electric vehicle charging stations within the parking garage and will coordinate with Zip-Car to provide car sharing services.

- ***Offer Guaranteed Ride Home*** – The Project will provide a guaranteed ride home in case of emergency to employees that commute to the Project by means other than private automobile.

- ***Direct Deposit for Employees*** – The Project will encourage tenants to offer direct deposit of paychecks for fulltime employees.

TDM trip reduction was calculated as 2% as follows:

- An article by Reid Ewing in Transportation Quarterly[5] concludes that preferential parking for vanpools and carpools has an employee trip reduction credit of 5%, a guaranteed ride home has a credit of 2%, promotion of a ride-sharing program has a reduction credit of 10%, and bicycle storage reduces employee trips 2%.

- In a TRCP report, Turnball and Pratt[6] conclude that programs that promote transit use, i.e. a Transportation Coordinator, reduce employee vehicle trips by 1 to 3% with the higher figure occurring when a project site is close to transit. Since the project site will be served both by an MBTA bus stop and a shuttle service, the figure of 3% was assumed.

- Total assumed reduction in employee trips of 22% is, however, only an intermediate calculation. Since employee trips represent 10% of total trips to the project site, the 22% reduction in employee trips translates to a 2% reduction in total vehicle trips from TDMs.

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[5] Ewing, R., "TDM , Growth Management, and the Other Four Out of Five Trips," Transportation Quarterly, Vol. 47, No. 3, 1993, pp 343-366.
[6] Turnball, K. and Pratt, R., "Transit Information and Promotion: Traveler Response to Transport System Changes," Chapter 11 in Transportation Cooperative Research Program Report #95, 2003.

Benefits of Mitigation

The Project will mitigate potential air quality impacts by implementing roadway/traffic signal improvements at certain intersections, to reduce vehicle idling times and emissions, and by implementing a number of TDM strategies, to reduce vehicle trips and emissions for the 2023 Build case. The VOC and NO_x emissions from project-related traffic for the 2023 Build with Mitigation case are 8.0 kg/day and 3.1 kg/day, respectively (see Tables 1 and 2). The *combined effect* of reduced vehicle idling from intersection improvements and reduced trips from TDM measures will reduce project-related VOC and NO_x emissions in 2023 by 20.0% and 18.4%, respectively. TDM measures alone reduce emissions 2%. The proposed roadway/traffic signal improvements and TDM measures constitute all reasonable and feasible traffic mitigation measures for a project that is well-served served by public transportation.

The Commonwealth's SIP for achieving compliance with the eight-hour ozone standard includes allowances for increases in VOC and NO_x emissions due to general background growth and emissions for this Project are included as part of the Commonwealth's background growth. The mesoscale air quality analysis demonstrates that the proposed Project will not have an adverse impact on regional air quality and will be compatible with the Commonwealth's SIP that will demonstrate how the Commonwealth will achieve attainment of the eight-hour NAAQS for ozone.

TABLE 1

MESOSCALE VOC EMISSIONS SUMMARY (kg/day)

Traffic Operation	Modeling Scenarios			
	2013 Existing	2023 No-Build	2023 Build	2013 Build with Mitigation
Moving	27.5	23.9	25.3	25.3
Idling	33.0	50.4	59.0	57.0
Total –All Vehicles	**60.5**	**74.3**	**84.3**	**82.3**
Project Traffic	**0.0**	**0.0**	**10.0**	**8.0**

TABLE 2

MESOSCALE NOx EMISSIONS SUMMARY (kg/day)

Traffic Operation	Modeling Scenarios			
	2013 Existing	2023 No-Build	2023 Build	2013 Build with Mitigation
Moving	49.9	22.5	23.9	23.8
Idling	18.2	14.3	16.7	16.1
Total – All Vehicles	**68.1**	**36.8**	**40.6**	**39.9**
Project Traffic	**0.0**	**0.0**	**3.8**	**3.1**

3.0 TRANSPORTATION GHG EMISSIONS

The transportation portion of the GHG analysis calculated emissions of CO_2 for the traffic study area for three traffic analysis scenarios:

- 2023 No-Build
- 2023 Build
- 2023 Build with Mitigation

The vehicle miles traveled (VMT) for the roadway segments in the traffic study area was calculated by multiplying the length of each road segment by the average daily traffic (ADT) volume on the segment. The CO_2 emissions for free-flowing traffic on each roadway segment were calculated by multiplying the daily VMT by the CO_2 emission factor of 550.40 grams per mile. Idling emissions were calculated at key intersections by multiplying the intersection delay times by the CO_2 emission factor of 1,407 and 1,423 grams per hour for 2013 and 2023, respectively. Appendix B presents the VMT, and moving and idling emission calculations.

Transportation CO_2 emissions are summarized in Table 3. The emissions listed for the 2023 Build case include both existing volumes on the roadway network and new Project-generated trips. The Project's transportation emissions are calculated by subtracting the 2023 No-Build values from those for the 2023 Build cases.

The Build with Mitigation case includes the effects of roadway improvements to reduce intersection delay times and the effects of Transportation Demand Management (TDM) measures, detailed in Section 2.4. Table 3 reveals the 2023 Build with Mitigation CO_2 emissions will be 2,399.3 tons/year, compared to 2,757.9 tons/year for the 2023 Build case, for a total reduction from roadway improvements and TDMs of 13.0%

TABLE 3

MOTOR VEHICLE CO_2 EMISSIONS SUMMARY

Total Predicted CO_2 Emissions Burden

2023 No-Build	2023 Build	2023 Build with Mitigation
77,930.9 kg/day	84,718.6 kg/day Project: 6,787.7 kg/day	83,826.5 kg/day Project: 5,895.6 kg/day
31,299.0 tons/yr	34,056.9 tons/year Project: 2,757.9 tons/year	33,698.3 tons/year Project: 2,399.3 tons/year

4.0 GREENHOUSE GAS (GHG) MITIGATION ANALYSIS

The GHG Policy requires that the Proponent to identify measures to avoid, minimize, or mitigate GHG emissions. Section 4.1 presents the methodology and summary of results. Sections 4.2 through 4.5 discuss the Project's site, building design, and transportation mitigation measures.

4.1 Methodology and Summary of Results

A greenhouse gas (GHG) emissions analysis was performed Wynn Everett, consistent with the Executive Office of Energy and Environmental Affairs (EOEEA) "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010). The development consists of approximately 1.4 million square feet (sf) of conditioned space, including a high-rise hotel, an entertainment facility including a casino, convention space, restaurants, retail stores, a health club, and a Winter Garden facing south over the Mystic River. There will be separate parking structures for patrons and employees. This GHG analysis conforms to the EOEEA Policy, and the proposed Project is consistent with the Commonwealth's Sustainable Development Principles.

The GHG Policy requires a project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of emissions reduction and energy savings. The GHG Emissions Policy and Protocol requires quantification of GHG emissions from three sources: direct emissions from on-site stationary sources, indirect emissions from energy generated off-site (electricity), and traffic generated by the Project. CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the MA Building Code (IECC 2012 and ASHRAE 90.1-2010), and (2) the Mitigation Alternative, which includes all energy saving measures.

This analysis uses the eQUEST energy design software (version 3.65), which incorporates the U.S. Department of Energy's DOE-2 building energy use model, and CO_2 emission rates of 117.1 lb/10^3 cubic feet of natural gas[7] and 719 lb/MWhr.[8] Note that while only one building is proposed, the

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[7] U.S. Department of Energy, Energy Information Administration, January 16, 2014.

[8] ISO New England Inc., 2012 New England Electric Generator Air Emissions Report, Annual Average Emission Rate, Table 5.2, December 2013.

podium and hotel tower portions of the building had to be analyzed separately in eQUEST to properly represent the different use characteristics. CO_2 emissions produced by project motor vehicle trips were analyzed using the emissions factor of 550.4 grams/mile for the year 2015.[9] The eQUEST model inputs are summarized in Table 6.

It should be noted that the Project has not progressed past an early conceptual level of design. For this reason, the Project commits to the GHG emission reduction presented below, but retains the flexibility to achieve this goal using energy efficiency measures that may be refined at the stage of detailed design. In some cases, the Project will build spaces equipped with full heating, ventilation, and air conditioning (HVAC) systems and lighting; in other cases, the Project will construct core and shell space in which individual tenants will fit-out the mechanical systems and lighting according to their needs. The Project will assist tenants in selecting energy efficiency measures. A draft outline for the Tenant Manual is provided in Section 4.6.

Energy use and CO_2 emissions are detailed in Tables 4A through 4F, and the eQUEST model output is provided in Appendix A. Table 5 summarizes total CO_2 emissions for the Project, for the Base Case (buildings that comply with MA Building Code), and the Mitigation Alternative (includes all energy saving measures). The eQUEST model input files have been provided to DOER. Transportation emission calculations are given in Appendix B.

The comprehensive list of EEMs presented in Section 4.3 constitute the Mitigation Alternative and will reduce total direct and indirect stationary source CO_2 emissions by 27.4% compared to the Base Case. The combination of intersection improvements to reduce vehicle idling and Transportation Demand Management (TDM) measures to reduce trips will reduce Project-related motor vehicle CO_2 emissions by 13.0%. The net reduction of the Project's total CO_2 emissions (stationary source, plus transportation) is 25.7% compared to the Base Case.

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[9] MEPA. "Greenhouse Gas Emissions Policy and Protocol," May 5, 2010, page 9.

TABLE 4A
ENERGY AND CO_2 MODELING FOR WYNN EVERETT
Podium Portion of the Building

Mitigation Measures - eQUEST Model Run	SF	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	Building	21,668.00		41,300.00		2,418.1	7,789.6	10,207.8	
Cool Roof	Total	21,638.00	-0.1%	41,500.00	0.5%	2,429.8	7,778.9	10,208.7	0.0%
Demand Control Ventilation	1.47m	21,936.00	1.2%	30,140.00	-27.0%	1,764.7	7,886.0	9,650.7	-5.5%
Higher Chiller Efficiency	square feet	21,468.00	-0.9%	41,300.00	0.0%	2,418.1	7,717.7	10,135.9	-0.7%
Daylighting Controls		20,608.00	-4.9%	43,150.00	4.5%	2,526.4	7,408.6	9,935.0	-2.7%
Lower Light Power Density		20,138.00	-7.1%	42,300.00	2.4%	2,476.7	7,239.6	9,716.3	-4.8%
Higher Refrigeration System Efficiency		21,333.80	-1.5%	41,300.00	0.0%	2,418.1	7,669.5	10,087.6	-1.2%
Low-Energy Electronic Gaming Machines		19,788.00	-8.7%	40,630.00	-1.6%	2,378.9	7,113.8	9,492.7	-7.0%
All Mitigation Measures		17,111.80	-21.0%	32,260.00	-21.9%	1,888.8	6,151.7	8,040.5	-21.2%

Note: The results summarized here should not be considered as final. The potential for energy savings will change during detailed building design.

TABLE 4B

ENERGY AND CO_2 MODELING FOR WYNN EVERETT

Hotel Tower Portion of the Building

Mitigation Measures - eQUEST Model Run	SF	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	Building	16,297.60		8,213.40		480.9	5,859.0	6,339.9	
Cool Roof	Total	16,297.60	0.0%	8,218.90	0.1%	481.2	5,859.0	6,340.2	0.0%
Energy Recovery Ventilation	1.47m	16,107.60	-1.2%	8,213.40	0.0%	480.9	5,790.7	6,271.6	-1.1%
Higher Chiller Efficiency	square feet	16,107.60	-1.2%	8,213.40	0.0%	480.9	5,790.7	6,271.6	-1.1%
Lower Light Power Density		15,027.60	-7.8%	8,400.50	2.3%	491.8	5,402.4	5,894.3	-7.0%
Energy STAR Appliances in Guest Rooms		15,497.60	-4.9%	8,321.50	1.3%	487.2	5,571.4	6,058.6	-4.4%
High Efficiency Elevators		16,215.50	-0.5%	8,213.40	0.0%	480.9	5,829.5	6,310.4	-0.5%
All Mitigation Measures		13,805.50	-15.3%	8,603.70	4.8%	503.7	4,963.1	5,466.8	-13.8%

Note: The results summarized here should not be considered as final. The potential for energy savings will change during detailed building design.

TABLE 4C
ENERGY AND CO_2 MODELING FOR WYNN EVERETT
Lighting for Parking Garages

Mitigation Measures	SF	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case (Code)	1,627,751	1,853.7		0.0		0.0	666.4	666.4	
Mitigation Alternative - Metal Halide		1,611.3	-13.1%	0.0	0.0%	0.0	579.3	579.3	-13.1%

TABLE 4D
ENERGY AND CO_2 MODELING FOR WYNN EVERETT
Ventilation for Parking Garages

Mitigation Measures	SF	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	1,627,751	7,978.0		0.0		0.0	2,868.1	2,868.1	
Mitigation Alternative - DCEV with VFD Fans		1,329.7	-83.3%	0.0	0.0%	0.0	478.0	478.0	-83.3%

0

TABLE 4E
ENERGY AND CO_2 MODELING FOR WYNN EVERETT
Potable Water and Wastewater Treatment Energy Use

Mitigation Measures		Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case		198.1		0.0		0.0	71.22	71.22	
Mitigation Alternative - Water Conserving Measures		158.5	-20.0%	0.0	0.0%	0.0	56.98	56.98	-20.0%

TABLE 4F

ENERGY AND CO_2 MODELING FOR WYNN EVERETT

All Buildings, Outdoor Lighting, Garage Ventilation and Water/Wastewater Treatment - Totals

All Buildings - Combined Mitigation	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (Mcf/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	47,995.4		49,513.4		2,899.0	17,254.3	20,153.4	
Mitigation Alternative All Mitigation Measures	34,016.8	-29.1%	40,863.7	-17.5%	2,392.6	12,229.0	14,621.6	-27.4%

1 MWhr = 3.412 MMBtu
1 Mcf = 1 MMBTU

Base Case 10^3 MMBtu	213.27
Mitigation Case 10^3 MMBtu	156.93
Percent reduction	**26.4**

TABLE 5

GREENHOUSE GAS (CO_2) EMISSIONS SUMMARY
WYNN EVERETT
(TONS/YEAR)

Source	Base Case	Mitigation Alternative	Change in GHG Emissions
Direct Emissions	2,899.0	2,392.6	-17.5%
Indirect Emissions	17,254.3	12,229.0	-29.1%
Subtotal Direct and Indirect Emissions	20,153.4	14,621.6	-27.4%
Transportation Emissions	2,757.9	2,399.3	-13.0%
Total CO_2 Emissions	22,911.3	17,020.9	-25.7%

4.2 Site Design Mitigation Measures

Wynn Everett will adopt all reasonable and feasible site design mitigation measures. The Project is committed to the following mitigation measures:

- ***Sustainable Development Principles*** – The Project promotes compact development and conserves land by reusing a vacant industrial site.

- ***Protect Open Space*** – The Project will create new public open spaces and walking paths along the waterfront of the Mystic River where none exist today.

- ***Connecting Sidewalks***– The City/DCR park and pathway system will be extended to the Project site to allow pedestrian and bicycle access to and from Wellington Station on the MBTA Orange Line.

- ***Promote Alternative Transportation to the Site*** – The Project site is ideally situated to take advantage of available public transportation resources in the area including subway service on the MBTA Orange Line, MBTA bus service, and water shuttle service. To that end, the following public transportation enhancements will be advanced as a part of the Project: 1) Fixed-route shuttle bus service will be provided to and from the Project and the MBTA Orange Line stations at Wellington Station and at Sullivan Square; 2) MBTA bus stops will be provided either within the Project site or along Broadway at the primary driveway; 3) The Project will provide accommodation for a water shuttle and the proponent is pursuing its feasibility.

- ***Design Water Efficient Landscaping*** –Water efficient landscaping will be installed to minimize water use. Drought-resistant and native plants will be used for landscaping. Collected rainwater will be reused for landscaped plants. Water sensors will be used to prevent unnecessary watering.

- ***Minimize Energy Use Through Building Orientation*** – The high-rise hotel will face southeast and the Winter Garden will face south. Both building elements will capture natural light in the winter months.

- ***Best Practices for Stormwater Design*** – The proposed stormwater control system will comply with MassDEP standards for Best Management Practices (BMP).

4.3 Building Design and Operation Mitigation Measures

Wynn Everett will adopt all reasonable and feasible building design and operational mitigation measures (listed below). The eQUEST energy model inputs are summarized in Table 6. Table 7 lists the Activity Areas for each building, plug loads and external electrical loads. The external electrical loads from Table 7 are added to the eQUEST model output to obtain the total electrical use stated in Tables 4A and 4B. The eQUEST model input files have been sent to Massachusetts DOER.

- ***Use Cool Roofing Materials*** –A reflective cool roof will be installed on all buildings.
- ***Energy Efficient Building Envelope*** –The Project will use roof insulation of R-25, wall insulation of R13+R13ci and windows with double low-e glass with a U=0.38.
- ***Skylights and Daylighting*** – Wynn Everett will have skylights above the entry atrium, along the length of the retail promenade and as part of the glass-enclosure for the Winter Garden at the south end of the building. The Project will provide light sensors with automatic dimming to maximize the utilization of natural light in these areas.
- ***Demand Control Ventilation*** – DCV controls for Outside Fresh Air used in the HVAC systems will be included in the design for the casino, public entertainment and retail spaces.
- ***Central Plant Chillers*** – The current Energy Code for a typical 300-ton chiller unit requires a Coefficient of Performance (COP) = 0.576 kW/ton. Project chillers will achieve a COP 10% better than Code.
- ***Energy Recovery Ventilation (ERV)*** – ERV will be used to pre-heat/cool outside air for the hotel. Consistent with MassDOER guidance, ERV is not used in conjunction with DCV.
- ***Seal, Test and Insulate HVAC Supply Ducts*** – HVAC supply ducts will be sealed, leak tested, and insulated to reduce energy losses.
- ***Energy Management Systems*** –The buildings will utilize energy management systems (EMS) to track and control energy use. Energy needs will be closely monitored and the use of heat, cooling, and lighting will be minimized. The Base Case set points for occupied and unoccupied time periods equal the eQUEST default values: Occupied (cool=76° , heat=70°). Whereas the Project will operate 24/7, no setbacks for unoccupied times are used in the modeling.

- ***Energy Efficient Interior Lighting*** – The Light Power Density (LPD) for all interior space will be 20% better than Code. The Code values are given in Table 5. Consistent with MassDOER guidance, the plug load values used in the eQUEST model are COMNET average values.

- ***High-Efficiency Refrigeration Systems*** – The walk-in freezers and refrigerators used in restaurant kitchens will achieve an approximate 15% energy reduction through the use of equipment with high-efficiency motors, high-efficiency compressors and anti-sweat heater controls.

- ***Low-Energy Electronic Gaming Machines (EGMs)*** – Most (80%) of the 3,200 EGMs in the gaming area will be a low-energy design with LED displays and high-efficiency processor chips. These EGMs have a typical electrical load of 35 W compared with standard machines at 96 W. Plug-load for the gaming area is 3.44 W/sf in the Base Case and 2.17 W/sf in the Mitigation Case. The electrical load attributable to gaming machines is 2,691 MWhr/yr in the Base Case and 1,291 MWhr/yr in the Mitigation Case. The difference of 1,400 MWhr/yr times the latest ISO New England emission factor of 719 lb CO_2 per MWhr yields a reduction in GHG emissions of 503.3 tons/year achievable through the purchase of high efficiency EGMs.

  The Project commits to purchasing high-efficiency EGMs whenever that choice is available for a particular type of gaming machine. The Mitigation Case assumes 80% of EGMs for the Project will be high-efficiency with a design load of 35 Watts. Purchasing guidelines will direct the purchase of the lowest electrical use option for a particular EGM when there are different energy-efficiency options available

- ***High-Efficiency Elevators*** – The high-rise hotel elevators will be designed with Variable Voltage Variable Frequency (VVVF) regenerative drives and LED lights to reduce electric use.

- ***Occupancy Controls for Lighting*** – Occupancy controls will be used in non-occupied, or infrequently occupied, spaces.

- ***Energy STAR Appliances***– Kitchen areas and offices will use refrigerators, computers, and other appliances that are Energy STAR rated for high efficiency. Guest rooms will use televisions and bar-refrigerators that are Energy-STAR rated for high efficiency.

- ***Energy Efficient Parking Garage Lighting*** – Energy efficient metal halide lamps will be used to light the parking structures.

- ***Demand Control Exhaust Ventilation (DCEV) with VFD Fans*** – Most of the parking spaces in the garages will be in an enclosed space. Ventilation of underground garages is required by code. The parking garages will have DCEV with variable frequency drive (VFD) fans to reduce electricity used for ventilation. Wherever possible in the project design, natural ventilation will be used for garage decks.

  The Base Case assumes continuous ventilation of all underground space. The electricity required for such ventilation is 0.5595 Watts/square foot (source: Intec Controls). Multiplied by the underground space of 1,627,751 square feet and 8760 hours/year yields a Base Case

electrical use of 7,978.0 MWhr/yr (see Table 4D). The parking garages will have DCEV with VFD fans. CO sensors will be placed within sections of the garage detect the need for ventilation to keep ambient CO levels below health thresholds. The fans will operate over a wide range of fresh air flow rates and unless CO levels are elevated, the fans will operate at a low minimum setting in compliance with International Mechanical Code (IMC) 2012 Section 404 for Enclosed Parking Garages. An analysis of actual fan operation and electrical use using DCEV with VFD fans reveals electrical use for the Mitigation Case will be 1/6 that of the Base Case (source: Intec Controls). Thus, the Mitigation Case electrical use is 1,329.7 MWhr/yr (see Table 4D).

- ***Use Water Conserving Fixtures and Practices*** – Restrooms will use low-flow faucets in wash sinks activated by motion sensors, and low-flow toilets and urinals (1.3 gallon per flush and 1 pint per flush, respectively). In conjunction with water-efficient landscaping, rainwater harvesting, and water sensors in plantings, the Mitigation Case targets a 20% reduction in water use for the project compared to the Base Case. The Base Case water demand is a maximum of 392,700 gallons per day (gpd) and the Base Case wastewater flow is 357,000 gpd. Using MEPA emission factors[10], electricity use for potable water and wastewater treatment calculates to 198.1 MWh/yr for the Base Case and 158.5 MWh/yr for the Mitigation Case (see Table 4E).

- ***Enhanced Building Commissioning*** – Wynn Everett will implement enhanced commissioning process for the building envelope and HVAC systems. A certified commissioning agent will be retained to develop and execute the commissioning plan to ensure the property operates at high efficiency levels throughout its life.

- ***Photovoltaic (PV) System*** – A PV system on the roof of the podium building, hotel tower and parking garage will provide approximately 3% of the Project's annual electrical consumption, or approximately 930 MWhr/year of electricity. A PV system of approximately 800-850 kW capacity will be installed to achieve this power production. This equates to a reduction of 334 tons/year in CO_2 emissions, assuming the latest ISO New England emission rate of 719 lb per MWhr. Given the constraints on the project site, the PV system will likely be installed in sections on the podium building roof, though some sections may be installed on the hotel tower roof or the roof of the parking garage. A total panel area of 80,000 to 85,000 square feet will be installed.

- ***Green Power*** – Wynn Everett will purchase approximately 7% of the Project's annual electrical consumption from local service providers of Green power.

- ***Cogeneration Plant*** – Wynn Everett will install a cogeneration plant using a nominal 1-MW microturbine burning natural gas. The energy analysis assumed average power output of 800 kW and 90% availability. The plant will provide approximately 20% of the Project's annual electrical consumption.

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[10] www.env.state.ma.us/mepa/ghg.aspx. For an MWRA community, water treatment energy use is 0.2 kWh/1,000 gallons treated and provided, and wastewater treatment energy use is 1.3 kWh/1,000 gallons treated.

The cogeneration plant is capable of providing 6,307 MWhr/year of on-site electrical generation, supporting 780 tons of absorption cooling, and providing up to 50 percent of the Project's annual heating and hot water needs. Absorption cooling will displace approximately 2,859 MWhr/year of electric chiller operation, and thus the cogeneration plant will displace a total of 9,266 MWhr/year of electrical use from the utility grid. Waste heat from the microturbine will provide 29,300 million Btu/year of usable heat for space heating and hot water. The microturbine will burn 899,000 therms (89,900 million Btu) of natural gas per year. The cogeneration plant will have overall efficiency approaching 70%, which exceeds the Massachusetts Efficiency Standard for cogeneration plants. It is estimated the plant will reduce Project CO_2 emissions by approximately 212 tons per year.

- ***Recycle Materials*** – The Project will provide adequate space for retail tenants to recycle materials, and the gaming facility will recycle cans, bottles, cardboard and office paper.

- ***Use Building Materials with Recycled Content, and Use Low-VOC Content*** – Whenever practical, the Project will use environmentally friendly building materials, including materials with recycled content, rapidly renewable building materials, and low-VOC materials.

Other building design and operation mitigation measures were considered for the Project, but were rejected because they are either technically/financially infeasible or inappropriate for the Project:

- ***Construct Green Roof*** -- The Project does not consider a green roof economically feasible. It consists of layers of gravel, soil and vegetation atop a water-proof membrane, and requires a steel-reinforced roof with an installation cost of $30/sf.[11] The significant additional costs ($10 million) related to the engineering, construction and installation of the green roof is not economically feasible and with the commitment for large skylight areas on the podium building, any green roof would have to be limited in area.

- ***Reduce Energy Demand by Using Peak Shaving or Load Shifting Strategies*** – These measures are not appropriate for an entertainment facility that operates 24 hours per day.

[11] Oberndorfer, Erica, et al., "Green Roofs as Urban Ecosystems: Ecological Structures, Functions and Services," BioScience, Vol. 57, No. 10, November 2007.

4.4 Additional Energy Mitigation Measures

The potential for alternative and renewable energy sources to be incorporated into the Project has been examined. The Project is only at an early conceptual level of design, and for this reason the following energy efficiency measures will be studied further at the stage of detailed building design:

- ***Recycling of Source-Separated Organics and Anaerobic Digestion*** – Massachusetts DEP will issue regulations later this year imposing a food waste disposal ban at restaurants, hotels, supermarkets and other institutions that generate over one ton of food waste per week[12]. The restaurants and kitchens of Wynn Everett are estimated to generate 5.4 tons per week of food waste[13], approximately 0.8 tons per day.

  Likely starting in late 2014, the waste ban will require source separated organics (SSO), namely food waste, to be collected and separated from trash. The preferred recycling option is processing an anaerobic digester (AD) plant that converts food waste into biogas and recyclable solids[14]. While there are very few operating food waste anaerobic digester (AD) plants in the U.S., two mixed waste AD plants are presently operating in Massachusetts in Rutland and Sheffield. These rely on a mixed feedstock of agricultural waste and food waste. Jordan Farms in Rutland is a 41.5 ton-per-day (15,000 ton per year) AD plant sitting on an equipment foot print of 30,300 square feet, approximately ¾ of an acre. A recent NREL feasibility study[15] of a potential food waste AD plant in Louisiana also assumed a 41 ton-per-day plant design on a one-acre site.

  There are two top-level paths for food waste recycling at Wynn Everett: on-site anaerobic digestion, or off-site anaerobic digestion. The on-site AD path has three options: (1) Build a large-scale AD facility; (2) Build a small-scale AD plant and burn the biogas in engines to make electricity; or (3) Build a small-scale plant and burn the biogas in boilers. Option 1 is for Wynn Everett to construct a large-scale AD plant to collect food waste from the resort casino and other institutions in surrounding cities and towns. To be economically viable, an AD plant needs to be sized for a capacity of 15 to 35 tons per day of food waste, which is equivalent to the energy output of 200 kW to 500 kW from biogas-driven engines. Even then, a regional sized food waste-only plant may not be economically feasible. For example, the NREL feasibility study of a 41 ton-per-day plant in Louisiana had a projected net present value of minus $6.7 million and could not pay for itself over time. A large-scale plant also needs approximately an acre of dedicated land for digester tanks, related equipment, and storage of process liquids and solids.

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[12] MassDEP, "Organics Study and Action Plan," revised June 2013.
[13] Draper/Lennon, Inc., "Identification, Characterization, and Mapping of Food Waste and Food Waste Generators in Massachusetts," report to MassDEP, September 19, 2002.
[14] Anaerobic digestion is a biological process in which micro-organisms break down ("digest") organic matter in the absence of oxygen and form biogas, which typically contains 60% methane, water vapor, carbon dioxide, sulfurous and other organic compounds. After cleanup, biogas can be burned to generated heat or electricity. The remaining organic solids are rich in nutrients and may be used as a fertilizer or soil conditioner.
[15] National Renewable Energy Laboratory, "Feasibility Study of Anaerobic Digestion of Food Waste in St. Bernard, Louisiana, NREL/TP-7A30-57082, January 2013.

Wynn Everett does not have an excess acre of open land on the project site for such an AD plant. Thus, we conclude Option 1 is not technically feasible due to inadequate land area on the site, and may not be economically feasible since a comparable food waste-only facility has not been built and proven to operate profitably over a number of years in Massachusetts.

Option 2 is build a small-scale AD plant and burn the biogas in engines to make electricity. We assume the size of such a small plant would not be a problem for the project site, and estimate the electricity from biogas-driven engines to be 14 kW. That small amount of electrical output is too small to be economically viable; the minimum size engines for this type of operation are in the 100 kW range. Thus, an AD plant generating electricity has not been commercially demonstrated at the very small size of 0.8 tons-per-day and is not economically feasible.

Option 3 is build a small-scale plant and burn the biogas in boilers. Again, we assume the size of such a small plant would not be a problem for the project site. Anaerobic digestion of 0.8 tons-per-day of food waste is estimated to produce 2,290 cubic feet of digester biogas, which is 1.6 cfm of digester gas. On a heating value basis, this is equivalent to 0.8 cfm of natural gas fuel (methane). Before the biogas can be burned in a boiler or other combustion device, it must be cleaned to remove particulate matter (PM), excess water vapor, sulfurous and other organic compounds otherwise the boiler manufacturer will void the combustion unit's warranty. The cost of gas-cleaning controls is substantial and makes no sense for a small flow of 1.6 cfm of digester gas in order to produce less than 1 cfm of equivalent natural gas at the end of the process. The end result is replacing less than 1 cfm of natural gas, which can be purchased for at low cost (less than $17 per day). Thus, because Wynn Everett will not knowingly void the warranty on their fuel combustion equipment, the required gas cleaning operation for 1.6 cfm of digester gas makes Option 3 economically infeasible. An on-site AD plant is most appropriate for a rural site with large amounts of open land and a large waste generation rate. By contrast, Wynn Everett has a small urban site with a low waste generation rate.

For this site and the small waste generation rate of 0.8 tons-per-day, the best recycling option is to contract to have the food waste, after pre-processing, hauled to a regional AD plant for processing. Wynn Everett will develop a robust SSO recycling program on a facility-wide basis that addresses all food service operations in the casino, hotel and the retail promenade. Source separation will start in the kitchens and dish rooms. Food waste will be collected in dedicated, leak-proof wheeled carts and depending on the hauler schedule, some carts may be refrigerated for a period of time to ensure sanitary conditions. Best Management Practices will be followed for collection frequency, container types and storage procedures.

To advance the viability of regional food waste processing, Wynn Everett will install a food waste macerator-dewatering unit in the largest kitchen to grind and dewater food waste before it is transported off site. This type of unit reduces the food waste volume by 80% and presents a homogenized waste that is more easily digested at a regional facility than raw food waste.

In summary, a preliminary analysis suggests an on-site AD plant is not feasible for the project. Wynn Everett will develop a robust SSO recycling program on a facility-wide basis that addresses all food service operations in the casino, hotel and the retail promenade. The recycling program will have dedicated storage for food waste including some refrigerated

storage. Wynn Everett will install a food waste macerator-dewatering unit in the largest kitchen to grind and dewater food waste before it is transported off site. The Project will seek a long-term contract for off-site anaerobic digestion of food waste.

- ***Water or Ground Source Heat Pumps*** – A high-rise hotel may be suitable for water-source or ground-source heat pumps. Due to the contaminated soils underlying the site and the need to contain and/or cap the contaminants not removed as part of foundation excavation, it is not practical to install the buried infrastructure required for ground-source heat pumps. Water-source heat pumps using a rooftop cooling tower will be considered as an option in the detailed mechanical design for the high-rise hotel building.

4.5 Solar Glare Analysis

A recent review of solar technologies by the Federal Aviation Administration (FAA)[16] identified potential concerns for solar glare impacts on aircraft pilots from certain types of solar collectors: dish collectors, parabolic collectors and heliostats with a central receiving tower, all of which focus and concentrate solar rays. By contrast, photovoltaic (PV) arrays, which do not focus or concentrate solar rays, have a glass surface with a non-reflective coating and create little or no glare potential. Numerous airports around the world have multi-mega-Watt PV installations located on their premises, not far from runways. Among these are the Denver, San Jose and Indianapolis International Airports, Nellis Air Force Base in Nevada, London's Gatwick Airport, Singapore's Changi Airport, Dusseldorf International Airport and Ontario's Thunder Bay Airport.

When the sun is reflected on a smooth surface, it can result in reflected glare. Pilots are familiar with this sort of reflection from water bodies. Ocean bays and rivers near airports have a higher level of reflectivity than the non-reflective glass of PV panels, which directly reflects only 2% of the incident sunlight.[17] A survey of aircraft controllers at airports with *on-airport* PV installations reveals no serious complaints from pilots or air traffic control.[18] Nevertheless, the FAA has issued a draft policy requiring Agency review of all *on-airport* solar installations to eliminate the potential for ocular impact to pilots or air traffic control; this policy does not apply to off-airport PV installations such as the one proposed for the Project site.[13] Under their policy, FAA only requires quantitative glare assessments for on-airport PV installations located within 2 miles of runway touchdown. Whereas the Project building is 3 miles from the nearest touchdown point at Logan International Airport, a glare assessment is not warranted or required. In summary, solar glare from PV panels on the Project building will not impact operations at Logan International Airport because: 1) All glass panels will have anti-reflective coatings; and 2) the distances of the PV installation from runway touchdown points at Logan are beyond the distance threshold set by FAA for on-airport installations.

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[16] FAA, "Review of Solar Projects on Federally-Obligated Airports," August 29, 2013.
[17] "Solar farm projects near airports: Is glare an issue?," www.solarchoice.net.au/blog.
[18] FAA, "Technical Guidance for Evaluating Selected Solar Technologies on Airports," FAA-ARP-TR-10-1, October 2010, p. 41.

TABLE 6

SUMMARY OF ENERGY MODELING ASSUMPTIONS
WYNN EVERETT

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Photovoltaic (PV) System	No	Yes, providing approximately 3% of Project's annual electrical use
Cogeneration plant	No	Yes, 1-MW microturbine
Cool Roofs	No	Yes
Building Envelope (steel-framed buildings)	Roof R25, Walls R13+R13ci Windows U=0.38	Same
Window Area as % of Wall Area	Hotel Tower 45% Podium 0-60% depending on direction	Hotel Tower 45% Podium 0-60% depending on direction
Demand Control Ventilation (DCV)	No	Yes, for the casino, public entertainment and retail spaces
Central Chiller 300-ton unit	COP 0.576 kW/ton	COP 0.518 kW/ton
Energy Recovery Ventilation (ERV)	No	Yes, for hotel 75% energy recovery
Cool/Heat Setpoints (occupied)	76° / 70° eQUEST Defaults	Same
Parking Garage Lighting	Parking Garages 130 W/1,000 SF	Parking Garages Metal Halide 113 W/1,000 SF

[1] Mass. Building Code 9th Edition including 2012 IECC.

TABLE 6 (CONTINUED)
SUMMARY OF ENERGY MODELING ASSUMPTIONS
WYNN EVERETT

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Light Power Density (Whole Building Method)	Retail 1.4 W/SF Office 0.9 W/SF Restaurant 1.60 W/SF Hotel 1.00 W/SF Warehouse 0.6 W/SF Health Club (Gym) 1.1 W/SF Casino/Convention 1.2 W/SF	Retail 1.12 W/SF Office 0.72 W/SF Restaurant 1.28 W/SF Hotel 0.8 W/SF Warehouse 0.48 W/SF Health Club (Gym) 0.88 W/SF Casino/Convention 0.96 W/SF
Skylights and Daylighting Controls	No	Yes for Entry Atrium, Retail Promenade, Winter Garden
Low-Energy EGMs	No	Yes
Parking Garage Ventilation DCEV with VFD Fans	No	Yes
Occupancy Controls for Lighting	No	Yes for unoccupied and infrequently occupied spaces
Elevators	SCR-Pulse Drive with Incandescent Lights	VVVF Regenerative Drive with LED Lights
Energy STAR Appliances	No	Yes, kitchens and offices, guest room TVs and bar refrigerators
Kitchen Refrigeration Systems Designed to Reduce Electrical Consumption	No	Yes by 15%

TABLE 7

SUMMARY OF ACTIVITY AREAS, PLUG LOADS AND EXTERNAL ELECTRICAL LOADS

WYNN EVERETT

Building Name Floor Area (sf)	eQUEST Activity Type	% Floor Area	Plug Load (W/sf)	External Electrical Load (MWhr/yr)
Podium Portion of Building	Casino/Gaming	29.2	3.44[a]	Refrigeration 2,228 (Base) 1,894 (Mit.)
	Office (General)	12.4	2.47	
	Retail Sales	6.4	0.86	
	Dining	7.9	1.53	
	Kitchen	2.1	1.56	
	Gymnasium	1.9	1.86	
	Convention Center	7.7	1.20	
	Storage (Conditioned)	32.4	0.45	
Hotel Tower Portion of Building	Guest Rooms	81.2	1.26	Elevators 137.6 (Base) 55.5 (Mit.)
	Corridor	9.1	1.26	
	Housekeeping/Storage	6.1	1.26	
	Elevator Lobbies	3.2	1.26	
	Mechanical/Electrical	0.4	1.26	

[a] Base Case plug load of 3.44 W/sf includes EGMs. Mitigation Case plug load is 2.17 W/sf.

4.6 Draft Outline for Tenant Manual

As part of the design phase of the project, Wynn Everett will implement a set of tenant guidelines in the Project Tenant Manual, which will either mandate or encourage specific sustainable measures, where applicable, reasonable and/or feasible for specific users. Each retail tenant and their design team will be provided a copy of the Tenant Manual upon executing a lease. With respect to the various energy efficiency commitments made within the Tenant Manual, it is assumed at this preliminary stage that the Project will be responsible for the construction of the building core and shell, with individual tenants responsible for the fit-out of their individual interior spaces.

The Tenant Manual will include the following requirements:

- The hotel tenant will be required to design interior lighting with a Light Power Density (LPD) 20% below the Code used in this EIR (the 2012 IECC).

- Where heating and cooling HVAC systems are not provided by the lessor, the tenant will be required to design cooling systems for EER or COP 10% better than the Code used in this EIR (the 2012 IECC).

- The Project will provide to future tenants a list of amenities (such as food services, bicycle storage) within Wynn Everett for tenants to pass on to their employees.

In addition, Wynn Everett will assist future tenants in selecting energy reduction measures as part of their construction and interior fit-out. Examples include:

- Encourage tenants to include DCV controls in HVAC system design.

- Encourage tenants to use Energy STAR rated refrigerators, computers and other equipment.

- Encourage tenants to use occupancy controls for lighting in restrooms and offices, and water-conserving bathroom fixtures that exceed Code.

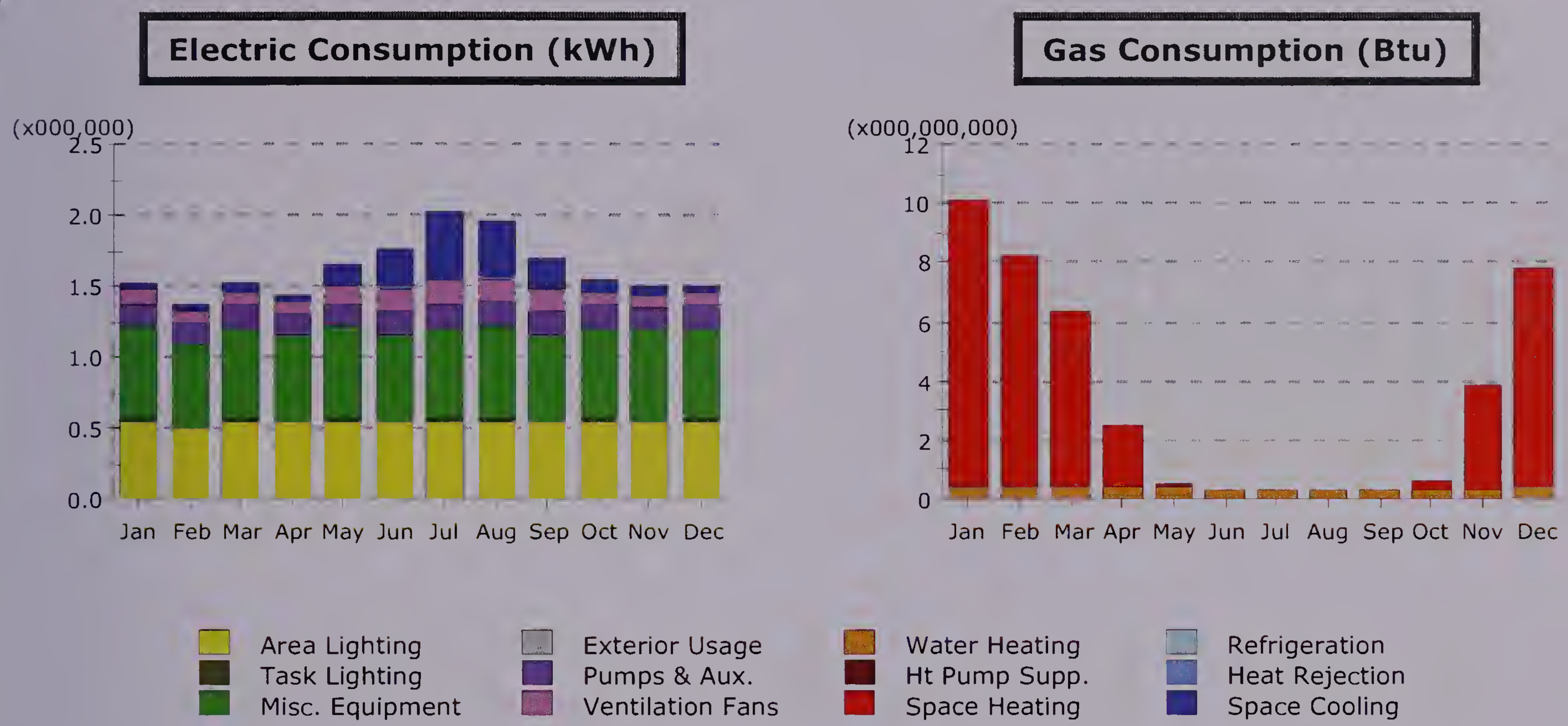
- Encourage tenants to offer direct deposit of employee paychecks, flexible work schedules, and ride-matching services to their employees.

- Encourage tenants to collect and recycle cans, bottles, cardboard, and office paper.

The modeling elements delegated to the tenant fit-out process are consistent with those that will be mandated as minimum tenant requirements in the Tenant Manual and lease agreements.

APPENDIX A

EQUEST MODEL OUTPUT



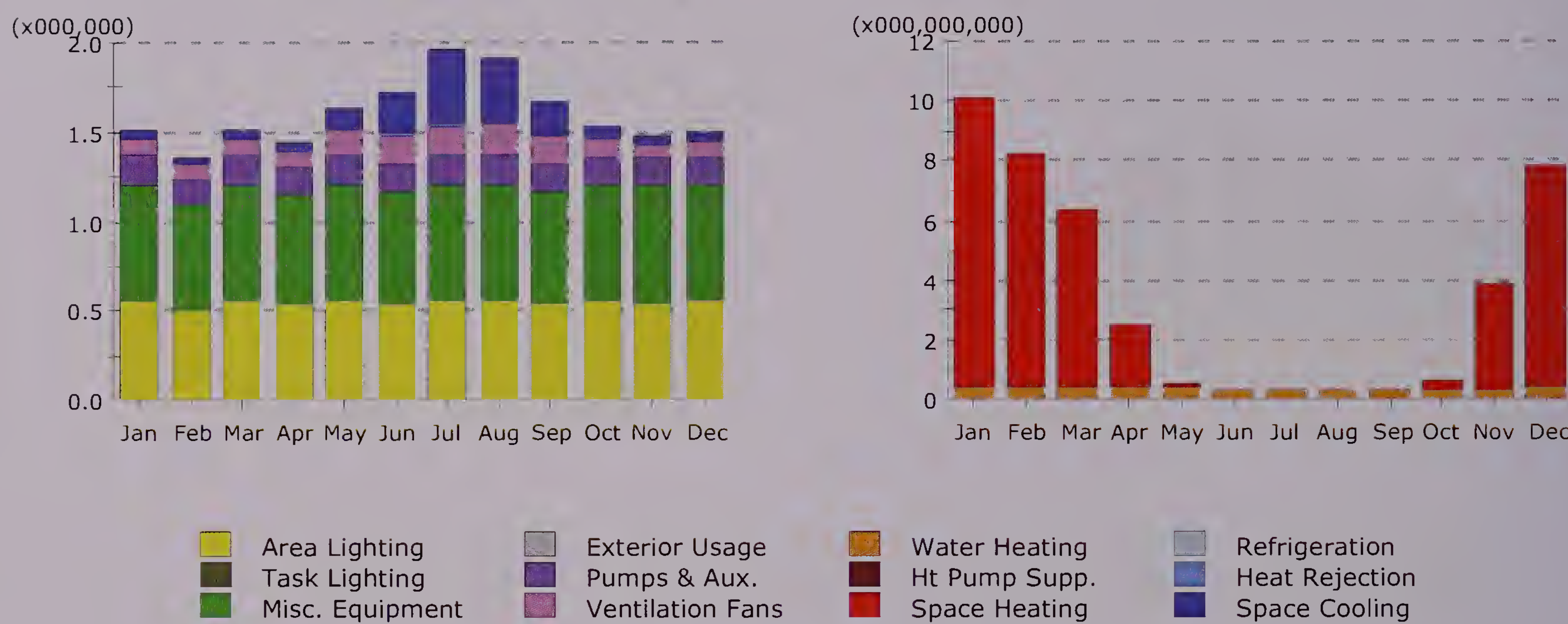
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.05	0.06	0.13	0.27	0.47	0.39	0.22	0.08	0.06	0.06	1.88
Heat Reject.	-	-	-	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.08	0.09	0.08	0.14	0.16	0.16	0.17	0.15	0.10	0.08	0.09	1.39
Pumps & Aux.	0.16	0.15	0.16	0.16	0.17	0.16	0.18	0.17	0.16	0.16	0.16	0.16	1.96
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.55	0.50	0.55	0.53	0.55	0.53	0.55	0.55	0.53	0.55	0.53	0.55	6.50
Total	1.52	1.37	1.51	1.44	1.64	1.75	2.02	1.95	1.70	1.54	1.49	1.51	19.44

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.73	7.88	5.96	2.08	0.17	-	-	-	0.00	0.27	3.54	7.44	37.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.12	8.24	6.37	2.45	0.54	0.33	0.32	0.31	0.30	0.59	3.89	7.81	41.30

Electric Consumption (kWh) **Gas Consumption (Btu)**

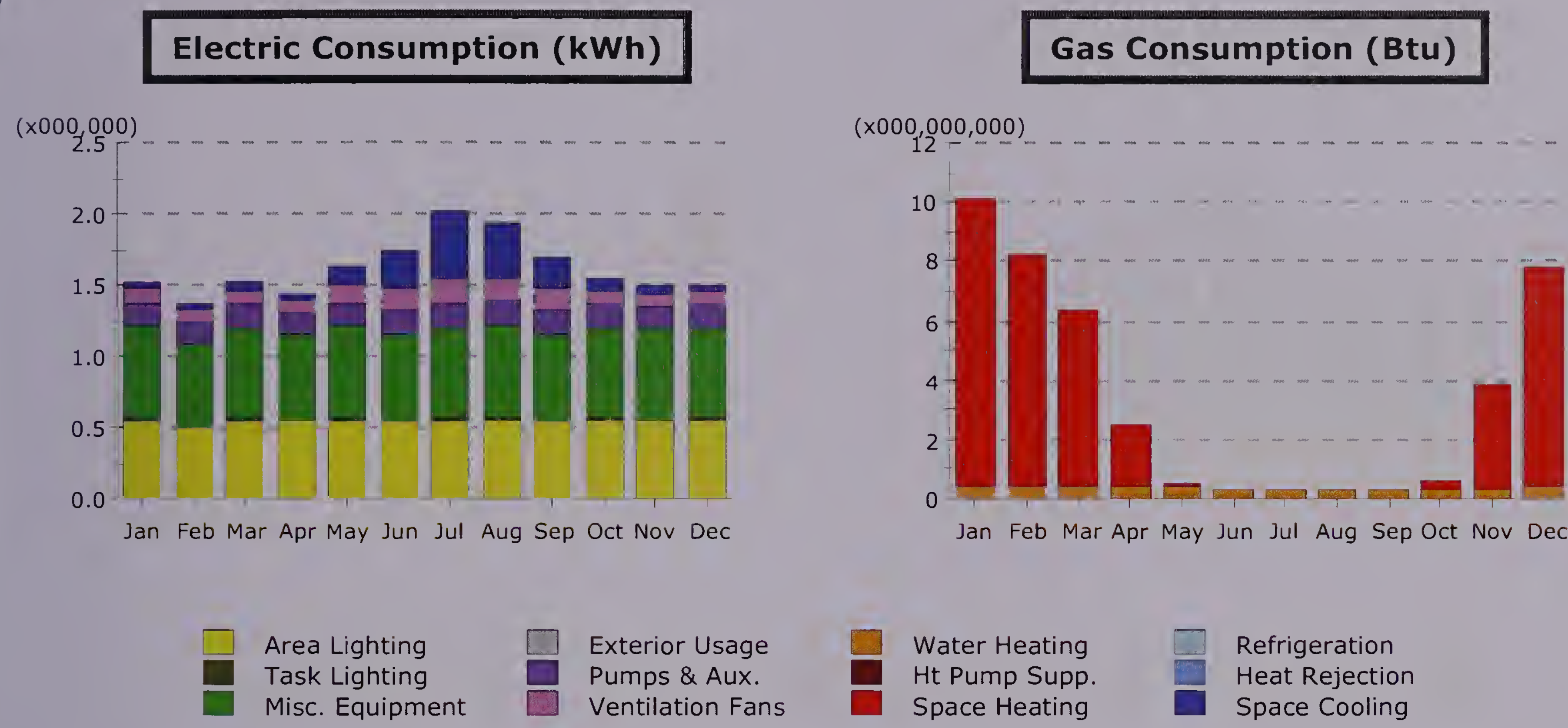


Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.04	0.05	0.05	0.12	0.24	0.42	0.35	0.20	0.07	0.05	0.05	1.69
Heat Reject.	-	-	-	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.08	0.09	0.08	0.14	0.16	0.16	0.17	0.15	0.10	0.08	0.09	1.39
Pumps & Aux.	0.16	0.15	0.16	0.16	0.16	0.16	0.18	0.17	0.16	0.16	0.16	0.16	1.95
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.55	0.50	0.55	0.53	0.55	0.53	0.55	0.55	0.53	0.55	0.53	0.55	6.50
Total	1.52	1.36	1.50	1.44	1.63	1.73	1.97	1.91	1.67	1.53	1.48	1.50	19.24

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.73	7.88	5.96	2.08	0.17	-	-	-	0.00	0.27	3.54	7.44	37.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.12	8.24	6.37	2.45	0.54	0.33	0.32	0.31	0.30	0.59	3.89	7.81	41.30



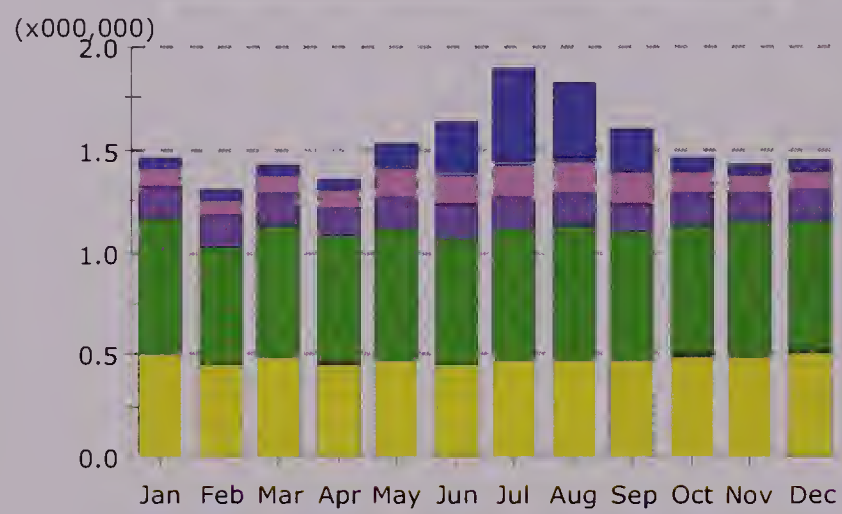
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.05	0.06	0.13	0.26	0.46	0.39	0.22	0.08	0.06	0.06	1.87
Heat Reject.	-	-	-	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.08	0.09	0.08	0.13	0.15	0.16	0.16	0.15	0.10	0.08	0.09	1.37
Pumps & Aux.	0.16	0.15	0.16	0.16	0.17	0.16	0.18	0.17	0.16	0.16	0.16	0.16	1.96
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.55	0.50	0.55	0.53	0.55	0.53	0.55	0.55	0.53	0.55	0.53	0.55	6.50
Total	1.52	1.37	1.51	1.44	1.64	1.75	2.01	1.94	1.69	1.54	1.49	1.51	19.41

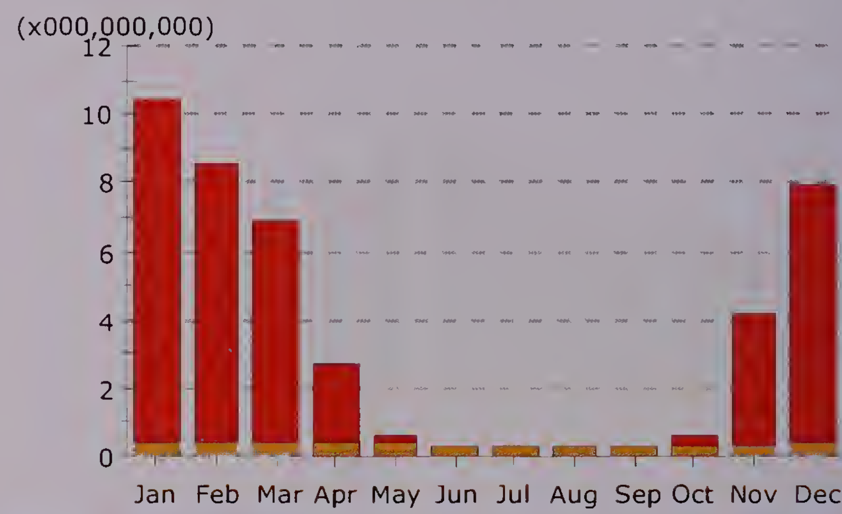
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.75	7.91	6.01	2.13	0.17	-	-	-	0.00	0.28	3.56	7.46	37.28
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.15	8.27	6.41	2.50	0.55	0.33	0.32	0.31	0.30	0.60	3.91	7.83	41.50

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting　Exterior Usage　Water Heating　Refrigeration
Task Lighting　Pumps & Aux.　Ht Pump Supp.　Heat Rejection
Misc. Equipment　Ventilation Fans　Space Heating　Space Cooling

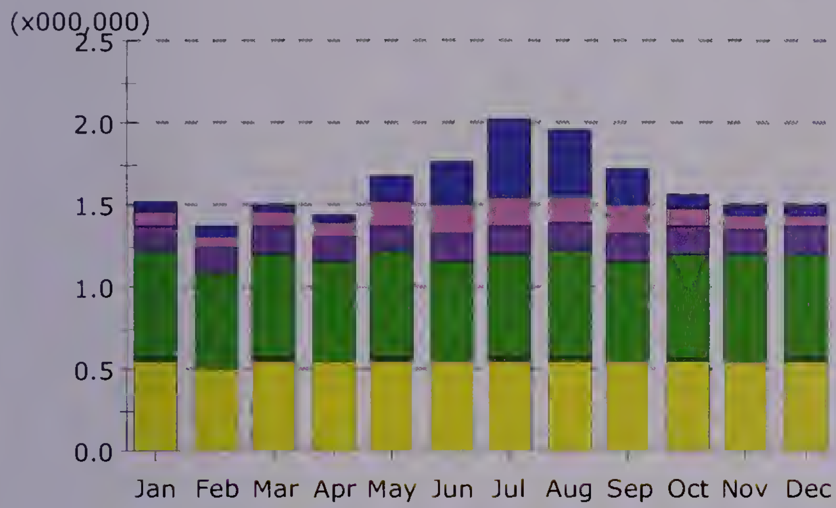
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.05	0.06	0.13	0.25	0.45	0.37	0.21	0.07	0.05	0.05	1.80
Heat Reject.	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.08	0.09	0.07	0.13	0.15	0.16	0.16	0.15	0.09	0.08	0.09	1.34
Pumps & Aux.	0.16	0.14	0.16	0.15	0.16	0.16	0.17	0.17	0.15	0.16	0.15	0.16	1.88
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.50	0.44	0.48	0.46	0.46	0.44	0.46	0.47	0.46	0.49	0.48	0.51	5.67
Total	1.46	1.31	1.43	1.35	1.53	1.63	1.89	1.83	1.60	1.45	1.43	1.45	18.38

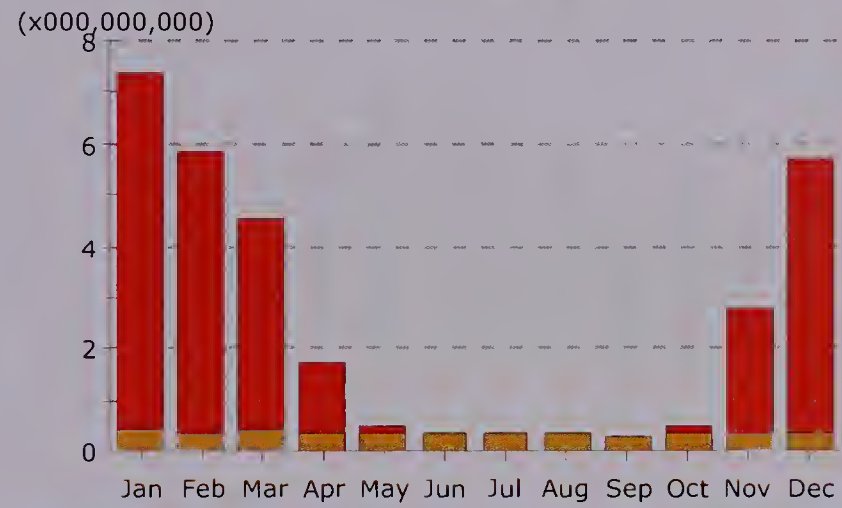
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	10.01	8.18	6.44	2.34	0.21	-	-	-	0.00	0.33	3.80	7.61	38.93
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.40	8.55	6.85	2.72	0.59	0.33	0.32	0.31	0.30	0.65	4.14	7.98	43.15

Electric Consumption (kWh)



Gas Consumption (Btu)



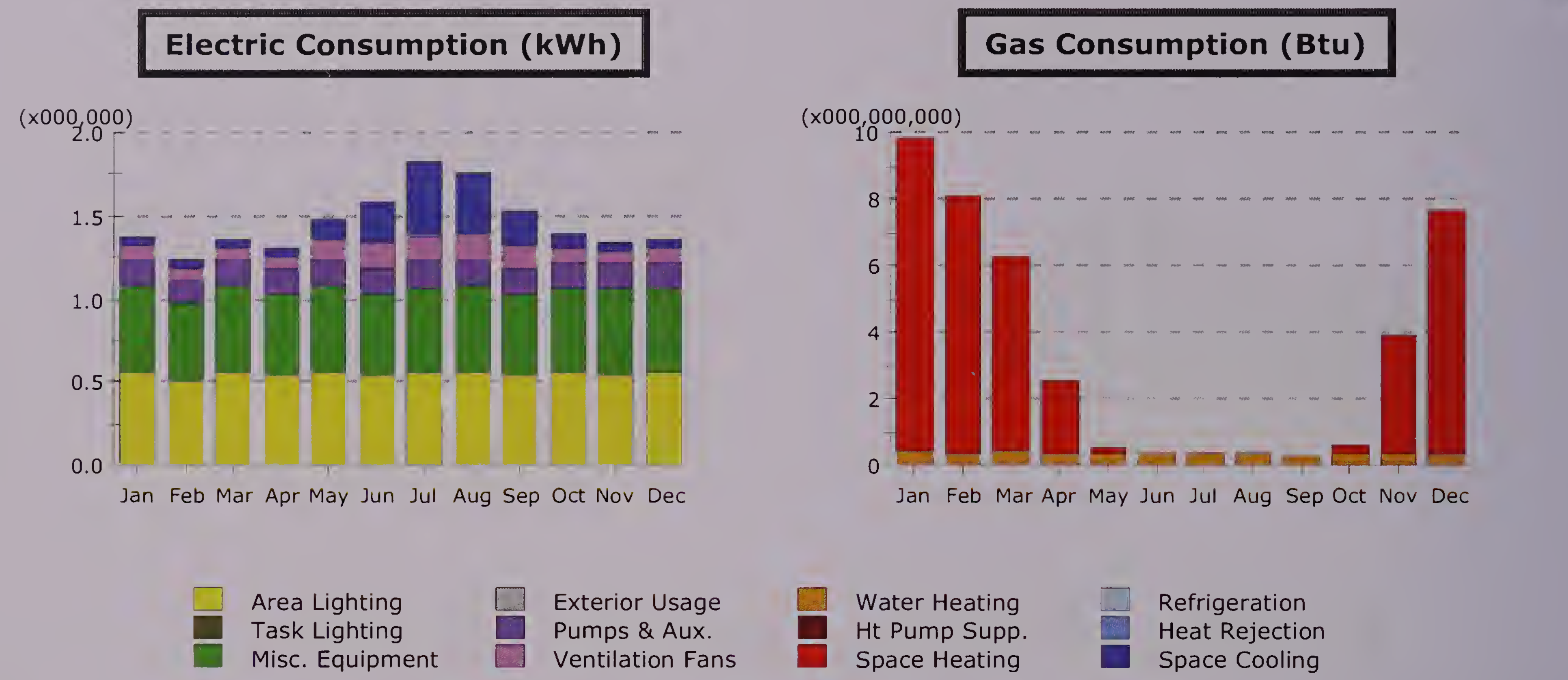
Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.06	0.05	0.06	0.06	0.14	0.27	0.47	0.39	0.23	0.08	0.06	0.06	1.90
Heat Reject.	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.08	0.08	0.16	0.17	0.17	0.17	0.17	0.12	0.08	0.08	1.43
Pumps & Aux.	0.16	0.15	0.16	0.16	0.17	0.16	0.18	0.17	0.16	0.16	0.16	0.16	1.97
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.55	0.50	0.55	0.53	0.55	0.53	0.55	0.55	0.53	0.55	0.53	0.55	6.50
Total	1.51	1.36	1.51	1.44	1.67	1.77	2.02	1.95	1.72	1.55	1.49	1.50	19.51

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	6.99	5.48	4.14	1.33	0.09	-	-	-	-	0.15	2.40	5.33	25.91
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.22
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7.38	5.85	4.55	1.71	0.47	0.33	0.32	0.31	0.30	0.47	2.75	5.69	30.14

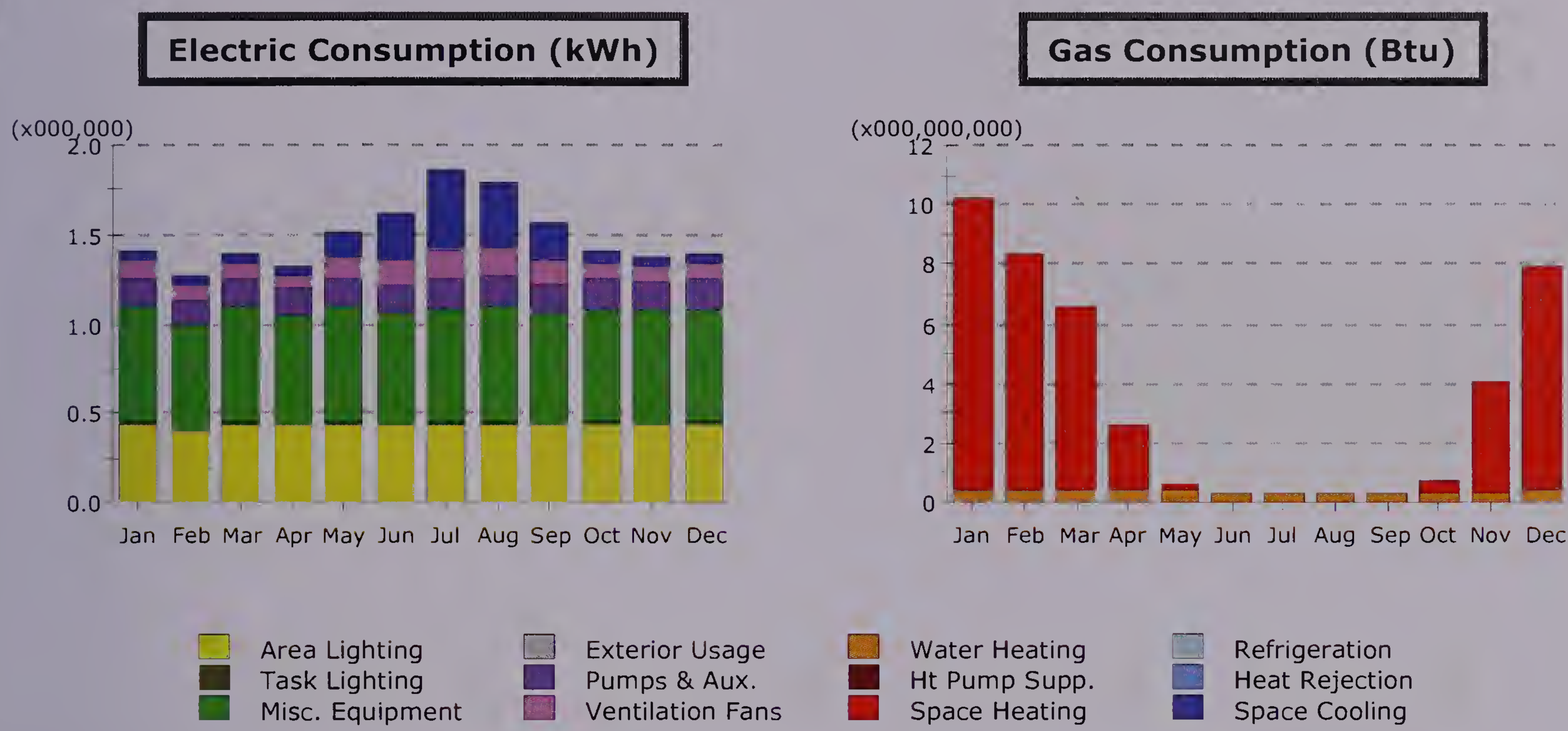


Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.05	0.06	0.13	0.25	0.44	0.36	0.21	0.07	0.05	0.05	1.77
Heat Reject.	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.08	0.07	0.12	0.14	0.15	0.15	0.13	0.09	0.08	0.09	1.27
Pumps & Aux.	0.16	0.14	0.16	0.15	0.16	0.16	0.17	0.17	0.15	0.16	0.15	0.16	1.88
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.51	0.46	0.51	0.48	0.51	0.49	0.50	0.51	0.49	0.50	0.51	0.50	6.00
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.55	0.50	0.55	0.53	0.55	0.53	0.55	0.55	0.53	0.55	0.53	0.55	6.50
Total	1.38	1.24	1.36	1.30	1.48	1.59	1.83	1.76	1.53	1.38	1.34	1.36	17.56

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.47	7.68	5.86	2.10	0.17	-	-	-	0.00	0.28	3.55	7.27	36.40
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9.87	8.05	6.27	2.48	0.55	0.33	0.32	0.31	0.30	0.60	3.90	7.64	40.63

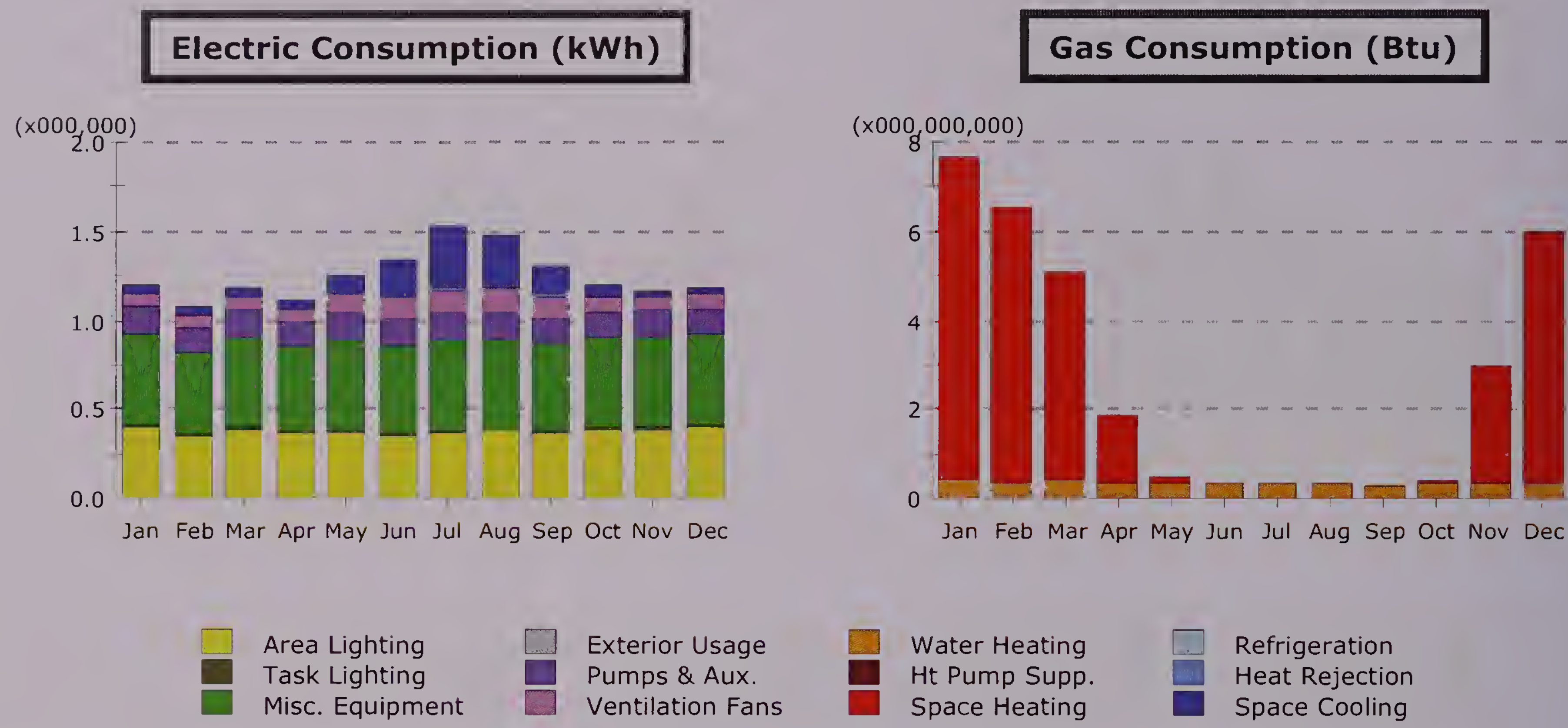


Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.05	0.06	0.13	0.25	0.45	0.37	0.21	0.07	0.06	0.05	1.80
Heat Reject.	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.04
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.08	0.07	0.12	0.15	0.15	0.15	0.14	0.09	0.08	0.09	1.30
Pumps & Aux.	0.16	0.14	0.16	0.15	0.16	0.16	0.17	0.17	0.16	0.16	0.15	0.16	1.90
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.65	0.58	0.65	0.61	0.65	0.62	0.64	0.65	0.62	0.64	0.65	0.64	7.56
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.20
Total	1.40	1.26	1.39	1.33	1.51	1.62	1.87	1.80	1.56	1.41	1.37	1.39	17.91

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.82	7.96	6.14	2.28	0.21	-	-	-	0.01	0.36	3.75	7.55	38.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.21	8.33	6.55	2.66	0.58	0.33	0.32	0.31	0.31	0.68	4.10	7.91	42.30



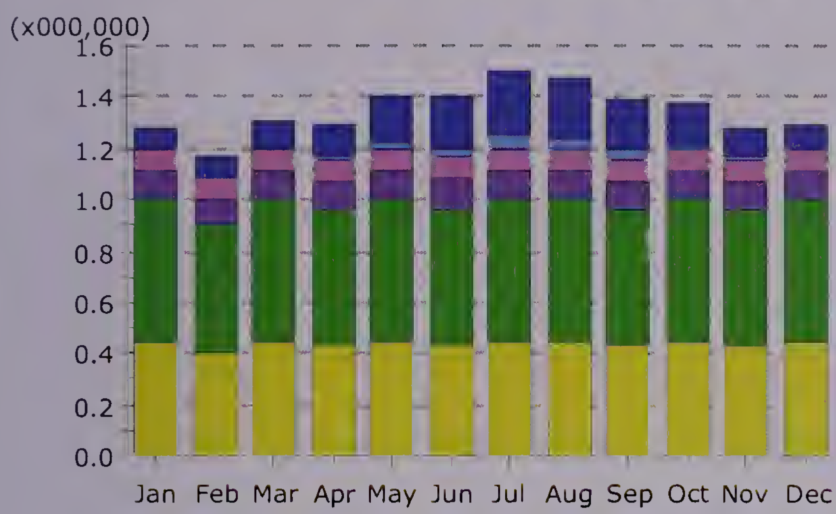
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.04	0.04	0.04	0.05	0.10	0.20	0.35	0.29	0.17	0.06	0.05	0.05	1.45
Heat Reject.	-	-	-	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.03
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.08	0.07	0.08	0.07	0.11	0.13	0.12	0.13	0.12	0.08	0.07	0.08	1.14
Pumps & Aux.	0.15	0.13	0.15	0.14	0.15	0.15	0.16	0.16	0.15	0.15	0.14	0.15	1.77
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.51	0.46	0.51	0.48	0.51	0.49	0.50	0.51	0.49	0.50	0.51	0.50	6.00
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	0.40	0.35	0.39	0.37	0.37	0.36	0.37	0.37	0.37	0.39	0.39	0.41	4.53
Total	1.20	1.07	1.18	1.11	1.26	1.33	1.53	1.48	1.31	1.20	1.17	1.19	15.02

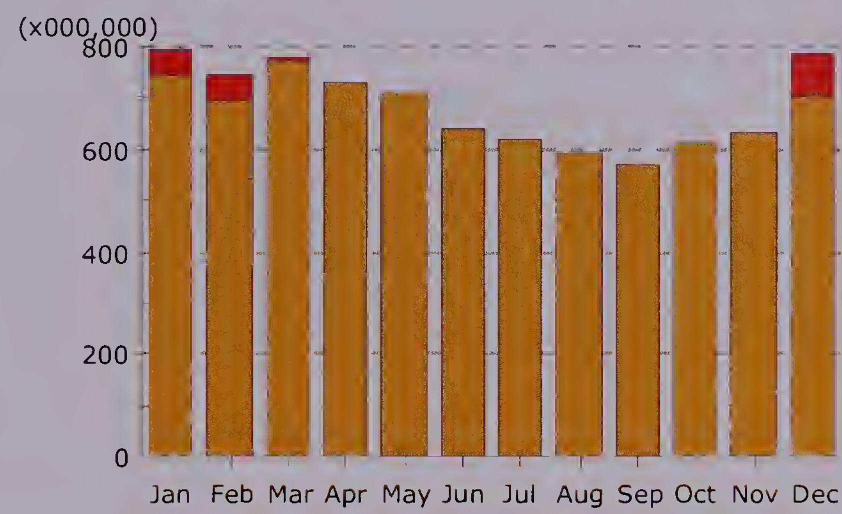
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	7.25	6.18	4.66	1.49	0.09	-	-	-	-	0.11	2.65	5.62	28.04
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.39	0.37	0.41	0.38	0.37	0.33	0.32	0.31	0.30	0.32	0.35	0.37	4.23
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	7.64	6.55	5.07	1.87	0.46	0.33	0.32	0.31	0.30	0.43	2.99	5.98	32.26

Electric Consumption (kWh)



Gas Consumption (Btu)



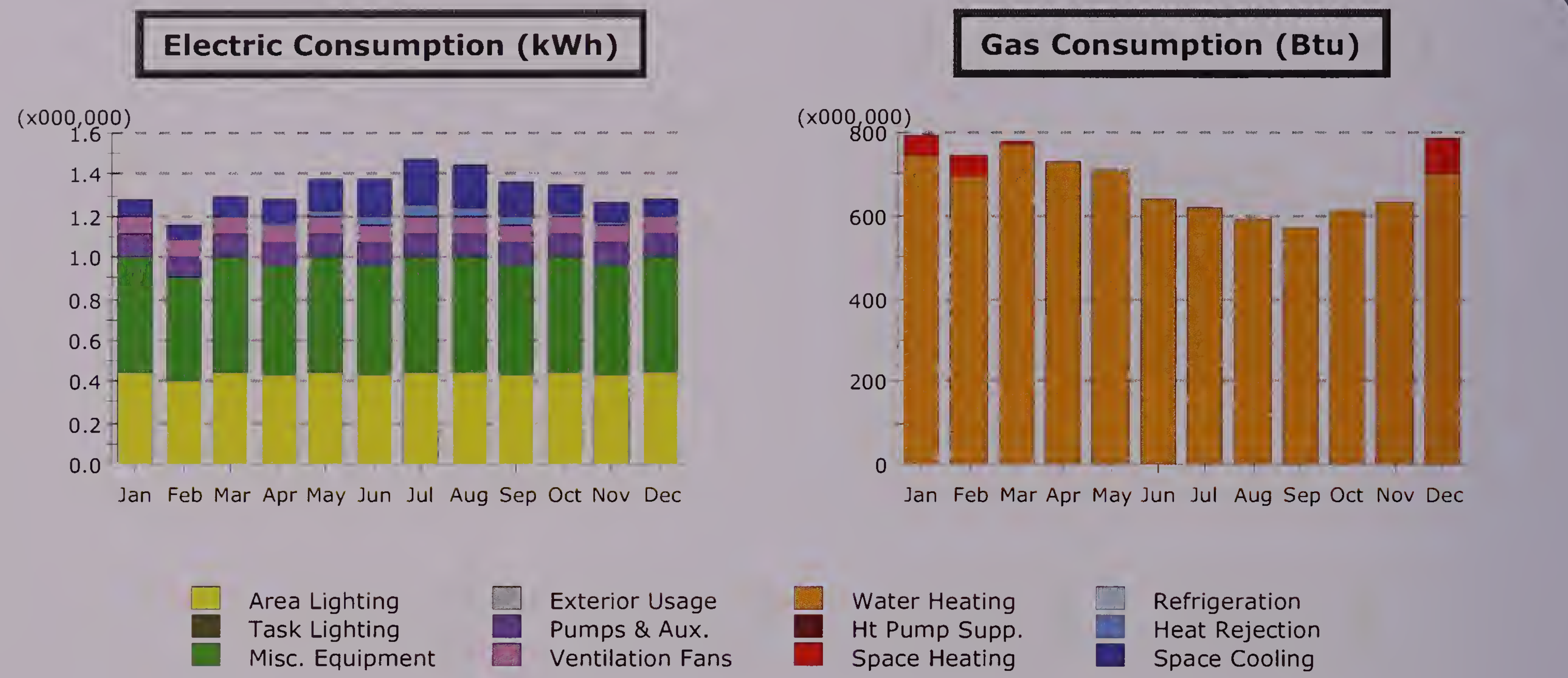
Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.08	0.08	0.11	0.13	0.18	0.21	0.25	0.23	0.19	0.16	0.11	0.09	1.83
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.05	0.04	0.03	0.02	0.01	0.00	0.21
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
Pumps & Aux.	0.12	0.11	0.12	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.12	1.39
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.50	0.55	0.54	0.55	0.54	0.55	0.55	0.54	0.55	0.54	0.55	6.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.19
Total	1.28	1.17	1.31	1.30	1.40	1.40	1.50	1.48	1.38	1.37	1.28	1.30	16.16

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	48.4	52.4	7.8	-	-	-	-	-	-	-	3.0	89.0	200.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.0	694.2	770.3	733.5	709.1	639.1	618.3	591.7	570.5	611.4	631.5	699.9	8,012.6
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	791.5	746.6	778.1	733.5	709.1	639.1	618.3	591.7	570.5	611.4	634.5	788.9	8,213.4



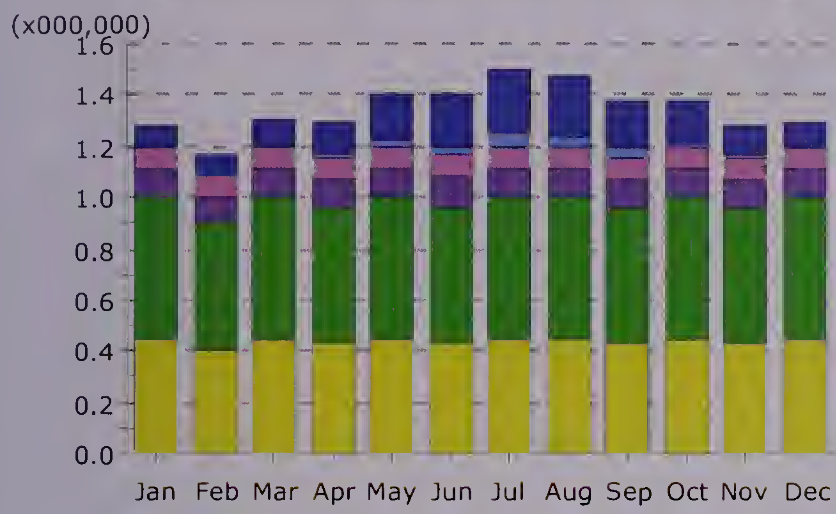
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.07	0.07	0.10	0.11	0.16	0.19	0.23	0.21	0.17	0.14	0.10	0.08	1.64
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00	0.21
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
Pumps & Aux.	0.12	0.10	0.12	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.12	1.38
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.50	0.55	0.54	0.55	0.54	0.55	0.55	0.54	0.55	0.54	0.55	6.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.19
Total	1.27	1.16	1.30	1.28	1.38	1.38	1.47	1.45	1.36	1.36	1.27	1.29	15.97

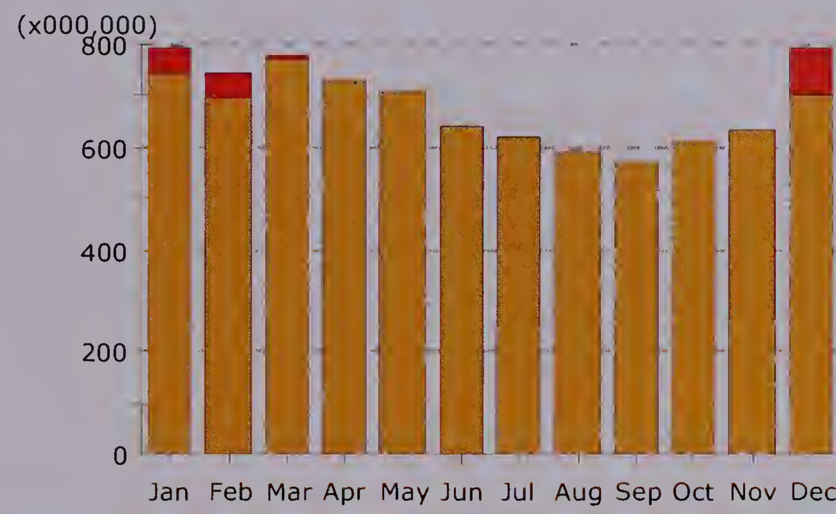
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	48.4	52.4	7.8	-	-	-	-	-	-	-	3.0	89.0	200.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.0	694.2	770.3	733.5	709.1	639.1	618.3	591.7	570.5	611.4	631.5	699.9	8,012.6
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	791.5	746.6	778.1	733.5	709.1	639.1	618.3	591.7	570.5	611.4	634.5	788.9	8,213.4

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

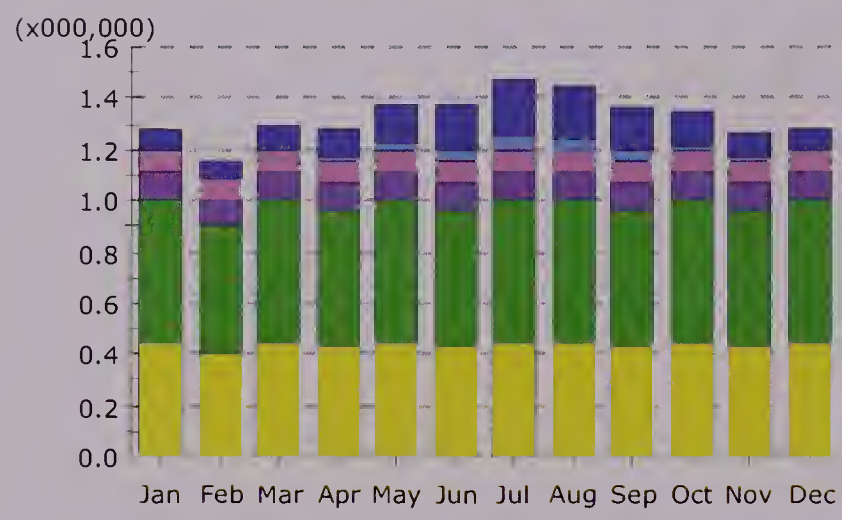
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.08	0.08	0.11	0.13	0.18	0.21	0.25	0.23	0.19	0.16	0.11	0.09	1.82
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00	0.21
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
Pumps & Aux.	0.12	0.11	0.12	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.12	1.39
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.50	0.55	0.54	0.55	0.54	0.55	0.55	0.54	0.55	0.54	0.55	6.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.19
Total	1.28	1.17	1.31	1.29	1.40	1.40	1.50	1.48	1.38	1.37	1.28	1.30	16.16

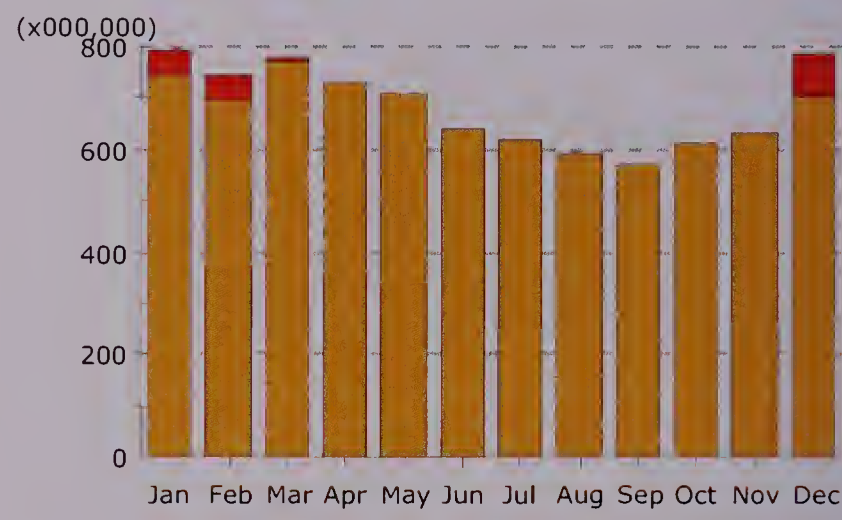
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	51.6	53.4	8.5	-	-	-	-	-	-	-	3.0	89.8	206.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.1	694.2	770.3	733.5	709.1	639.1	618.4	591.7	570.5	611.4	631.5	699.9	8,012.6
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	794.6	747.6	778.8	733.5	709.1	639.1	618.4	591.7	570.5	611.4	634.5	789.7	8,218.9

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

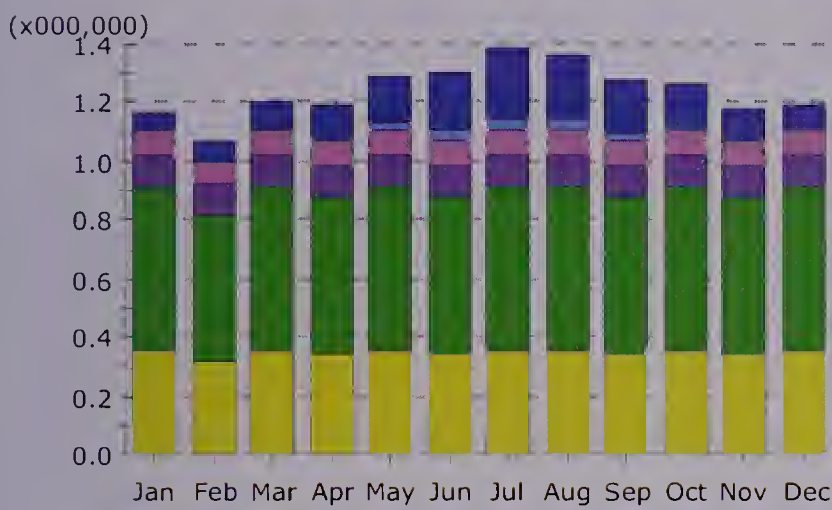
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.07	0.07	0.10	0.11	0.16	0.19	0.23	0.21	0.17	0.14	0.10	0.08	1.64
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00	0.21
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.09	0.08	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	1.02
Pumps & Aux.	0.12	0.10	0.12	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.12	1.38
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.50	0.55	0.54	0.55	0.54	0.55	0.55	0.54	0.55	0.54	0.55	6.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.19
Total	1.27	1.16	1.30	1.28	1.38	1.38	1.47	1.45	1.36	1.36	1.27	1.29	15.97

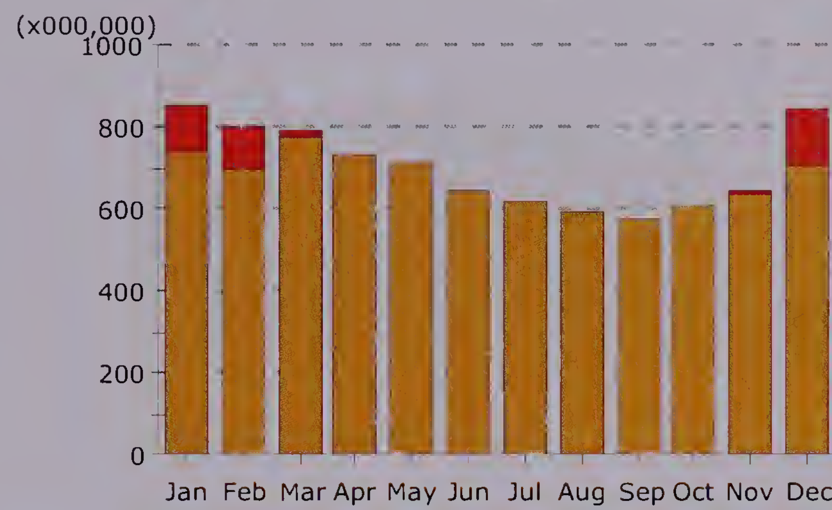
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	48.4	52.4	7.8	-	-	-	-	-	-	-	3.0	89.0	200.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.0	694.2	770.3	733.5	709.1	639.1	618.3	591.7	570.5	611.4	631.5	699.9	8,012.6
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	791.5	746.6	778.1	733.5	709.1	639.1	618.3	591.7	570.5	611.4	634.5	788.9	8,213.4

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

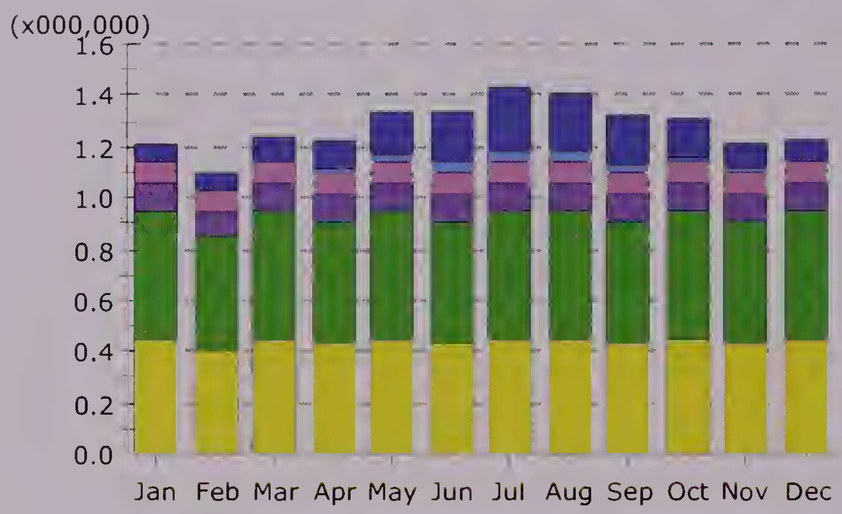
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.07	0.07	0.10	0.12	0.16	0.20	0.24	0.22	0.18	0.14	0.10	0.08	1.68
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.00	0.00	0.19
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.99
Pumps & Aux.	0.11	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.11	0.11	0.11	0.11	1.34
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.50	0.55	0.54	0.55	0.54	0.55	0.55	0.54	0.55	0.54	0.55	6.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.35	0.32	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.35	0.34	0.35	4.15
Total	1.17	1.07	1.20	1.19	1.29	1.30	1.39	1.37	1.28	1.26	1.18	1.19	14.89

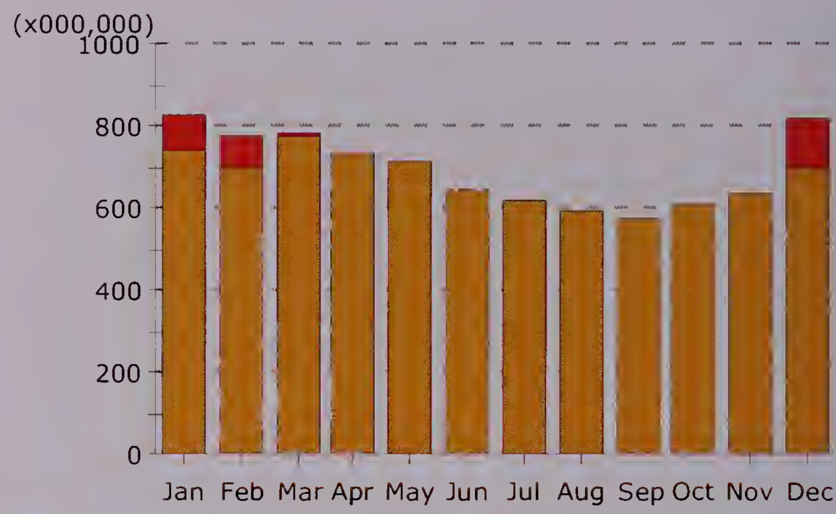
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	112.8	106.4	18.2	-	-	-	-	-	-	-	7.8	141.7	387.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.3	694.3	770.4	733.5	709.1	639.2	618.4	591.8	570.6	611.4	631.6	700.0	8,013.5
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	856.1	800.7	788.6	733.5	709.1	639.2	618.4	591.8	570.6	611.4	639.3	841.8	8,400.5

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

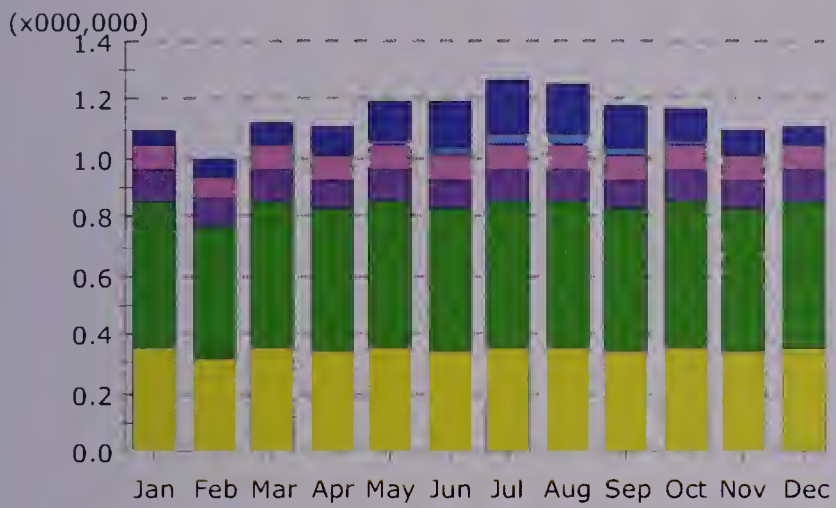
Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.07	0.07	0.10	0.12	0.17	0.20	0.24	0.23	0.19	0.15	0.11	0.09	1.73
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00	0.20
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.00
Pumps & Aux.	0.11	0.10	0.11	0.11	0.12	0.11	0.12	0.12	0.11	0.11	0.11	0.11	1.36
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.50	0.45	0.50	0.48	0.50	0.48	0.50	0.50	0.48	0.50	0.48	0.50	5.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.44	0.40	0.44	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.43	0.44	5.19
Total	1.21	1.10	1.24	1.23	1.33	1.34	1.43	1.41	1.32	1.30	1.21	1.23	15.36

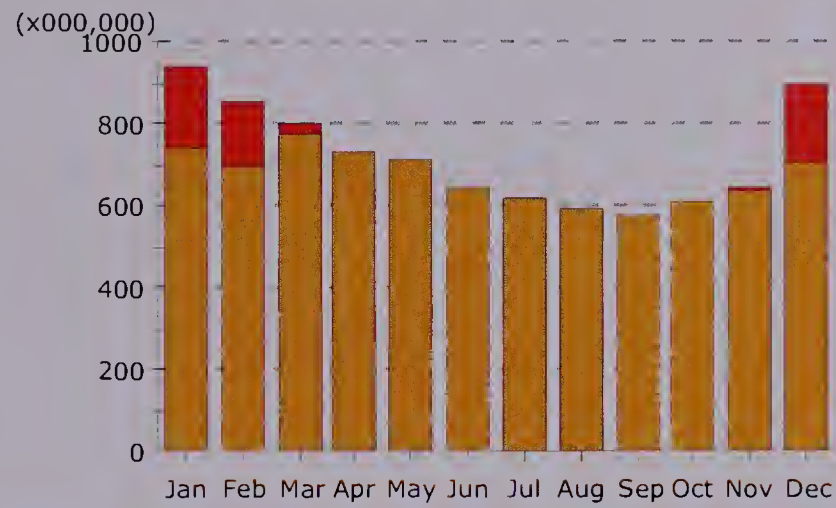
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	85.5	83.5	14.0	-	-	-	-	-	-	-	5.5	119.9	308.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.2	694.3	770.4	733.5	709.1	639.2	618.4	591.8	570.6	611.4	631.5	700.0	8,013.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	828.6	777.8	784.3	733.5	709.1	639.2	618.4	591.8	570.6	611.4	637.0	819.9	8,321.5

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

Electric Consumption (kWh x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.05	0.05	0.07	0.09	0.13	0.15	0.18	0.17	0.14	0.11	0.08	0.06	1.28
Heat Reject.	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.01	0.00	0.00	0.18
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.97
Pumps & Aux.	0.11	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.31
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.50	0.45	0.50	0.48	0.50	0.48	0.50	0.50	0.48	0.50	0.48	0.50	5.86
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.35	0.32	0.35	0.34	0.35	0.34	0.35	0.35	0.34	0.35	0.34	0.35	4.15
Total	1.09	0.99	1.12	1.10	1.19	1.19	1.27	1.25	1.18	1.17	1.09	1.11	13.75

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	194.4	154.3	32.2	-	-	-	-	-	-	-	14.1	194.5	589.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	743.4	694.4	770.5	733.6	709.1	639.2	618.4	591.8	570.6	611.4	631.6	700.2	8,014.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	937.8	848.8	802.6	733.6	709.1	639.2	618.4	591.8	570.6	611.4	645.7	894.6	8,603.7

APPENDIX B

TRANSPORTATION EMISSION CALCULATIONS

PART A

MESOSCALE ANALYSIS CALCULATIONS

TABLE B-1
Vehicle Miles Traveled (VMT) in the Mesoscale Study Area
Wynn Harbor Park Project

Link I.D.	Link Length (feet)	Link Descriptor	Average Daily Traffic (ADT) (vehicles/day)				Vehicle Miles Traveled (VMT) (miles/day)			
			2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*	2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*
1	633	Main St Connectors to Sweetser Circle	12,280	13,510	14,150	14,137	1,472	1,620	1,696	1,695
2	635	Rt 99 Connectors to Sweetser Circle	9,500	10,980	11,380	11,372	1,143	1,321	1,369	1,368
3	680	Rt 16 Connectors to Sweetser Circle	4,640	5,050	6,260	6,236	598	650	806	803
4	840	Rt 99 between Sweetser Circle & Bowdoin St.	19,480	22,400	27,970	27,859	3,099	3,564	4,450	4,432
5	1,264	Sweetser Circle	16,570	18,620	21,930	21,864	3,967	4,458	5,250	5,234
6	770	Rt 16 W Off Ramp to Sweetser Circle	9,420	10,650	13,460	13,404	1,374	1,553	1,963	1,955
7	2,272	Rt 99 between Sweetser and Santilli Circles	11,190	12,940	15,890	15,831	4,815	5,568	6,838	6,812
8	3,466	Rt 16 Santilli Circle Connectors through Sweetser Circle	30,700	33,270	33,270	33,270	20,153	21,840	21,840	21,840
9	1,500	Santilli Circle	15,640	17,300	18,890	18,858	4,443	4,915	5,366	5,357
10	507	Rt 16 within Santilli Circle	24,650	26,830	26,830	26,830	2,367	2,576	2,576	2,576
11	414	Santilli Highway to Santilli Circle Connectors	3,780	4,710	4,710	4,710	296	369	369	369
12	257	Rt 16 West Bound Connector	9,900	11,130	11,820	11,806	482	542	575	575
13	237	Rt 16 East Bound Connector to Santilli Circle	28,620	31,720	33,310	33,278	1,285	1,424	1,495	1,494
14	630	Rt 16 East Bound to Mystic View Road	6,390	6,720	6,720	6,720	762	802	802	802
15	582	Mystic View Road to Santilli Circle Connectors	22,030	23,160	23,160	23,160	2,428	2,553	2,553	2,553
16	1,450	Rt 99 between Beacham St and Horizon Way	20,950	24,240	27,600	27,533	5,753	6,657	7,580	7,561
17	5,075	Rt 99 to Sullivan Square Connectors	15,020	30,880	29,550	29,577	14,437	29,681	28,403	28,428
18	395	Main Street (Rt 38) to Sullivan Square Connector	8,660	13,550	17,010	16,941	648	1,014	1,273	1,267
19	325	Maffa Way to Sullivan Square Connector	10,800	11,470	14,630	14,567	665	706	901	897
20	375	Cambridge Street to Sullivan Square Connector	14,610	15,870	21,420	21,309	1,038	1,127	1,521	1,513
21	720	Rutherford Ave to Sullivan Square Connectors	15,540	28,540	23,430	23,532	2,119	3,892	3,195	3,209
22	620	Main St. to Sullivan Square Connectors	7,930	11,860	14,130	14,085	931	1,393	1,659	1,654
23	1,328	Sullivan Square	20,560	24,960	31,890	31,751	5,171	6,278	8,021	7,986
24	620	Beacham Street to Rt 99	3,120	3,290	3,720	3,711	366	386	437	436
						VMT (miles/day):	79,812	104,887	110,937	110,816

*Mitigation assumes an 2% reduction in the total project-generated traffic due to the implementation of propo sporation Demand Management (TDM).

TABLE B-2
Mesoscale Study Area
Total Daily Volatile Organic Compound (VOC) Emissions
Wynn Harbor Park Project

		MOBILE6.2 VOC Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale VOC Emissions (kg/day)			
Link I.D.	Speed (mph)	2013	2023	2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*	2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*
1	15	0.41	0.28	1,472	1,620	1,696	1,695	0.6	0.5	0.5	0.5
2	15	0.41	0.28	1,143	1,321	1,369	1,368	0.5	0.4	0.4	0.4
3	20	0.36	0.24	598	650	806	803	0.2	0.2	0.2	0.2
4	30	0.30	0.20	3,099	3,564	4,450	4,432	0.9	0.7	0.9	0.9
5	20	0.36	0.24	3,967	4,458	5,250	5,234	1.4	1.1	1.2	1.2
6	20	0.36	0.24	1,374	1,553	1,963	1,955	0.5	0.4	0.5	0.5
7	25	0.32	0.21	4,815	5,568	6,838	6,812	1.6	1.2	1.5	1.5
8	25	0.32	0.21	20,153	21,840	21,840	21,840	6.5	4.7	4.7	4.7
9	20	0.36	0.24	4,443	4,915	5,366	5,357	1.6	1.2	1.3	1.3
10	15	0.41	0.28	2,367	2,576	2,576	2,576	1.0	0.7	0.7	0.7
11	15	0.41	0.28	296	369	369	369	0.1	0.1	0.1	0.1
12	20	0.36	0.24	482	542	575	575	0.2	0.1	0.1	0.1
13	15	0.41	0.28	1,285	1,424	1,495	1,494	0.5	0.4	0.4	0.4
14	20	0.36	0.24	762	802	802	802	0.3	0.2	0.2	0.2
15	15	0.41	0.28	2,428	2,553	2,553	2,553	1.0	0.7	0.7	0.7
16	30	0.30	0.21	5,753	6,657	7,580	7,561	1.7	1.4	1.6	1.6
17	25	0.32	0.21	14,437	29,681	28,403	28,428	4.7	6.3	6.0	6.1
18	15	0.41	0.28	648	1,014	1,273	1,267	0.3	0.3	0.4	0.4
19	15	0.41	0.28	665	706	901	897	0.3	0.2	0.3	0.3
20	15	0.41	0.28	1,038	1,127	1,521	1,513	0.4	0.3	0.4	0.4
21	15	0.41	0.28	2,119	3,892	3,195	3,209	0.9	1.1	0.9	0.9
22	15	0.41	0.28	931	1,393	1,659	1,654	0.4	0.4	0.5	0.5
23	20	0.36	0.24	5,171	6,278	8,021	7,986	1.8	1.5	1.9	1.9
24	20	0.36	0.24	366	386	437	436	0.1	0.1	0.1	0.1
					Total Daily VOC Emissions (kg/day):			27.47	23.93	25.33	25.30

*Mitigation assumes an 2% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE B-3
Mesoscale Study Area
Total Daily Volatile Organic Compound (NOx) Emissions
Wynn Harbor Park Project

		MOBILE6.2 NOx Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale NOx Emissions (kg/day)			
Link I.D.	Speed (mph)	2013	2023	2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*	2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*
1	15	0.71	0.24	1,472	1,620	1,696	1,695	1.0	0.4	0.4	0.4
2	15	0.71	0.24	1,143	1,321	1,369	1,368	0.8	0.3	0.3	0.3
3	20	0.64	0.22	598	650	806	803	0.4	0.1	0.2	0.2
4	30	0.58	0.24	3,099	3,564	4,450	4,432	1.8	0.9	1.1	1.1
5	20	0.64	0.22	3,967	4,458	5,250	5,234	2.5	1.0	1.1	1.1
6	20	0.64	0.22	1,374	1,553	1,963	1,955	0.9	0.3	0.4	0.4
7	25	0.60	0.20	4,815	5,568	6,838	6,812	2.9	1.1	1.4	1.4
8	25	0.60	0.20	20,153	21,840	21,840	21,840	12.1	4.4	4.4	4.4
9	20	0.64	0.22	4,443	4,915	5,366	5,357	2.8	1.1	1.2	1.2
10	15	0.71	0.24	2,367	2,576	2,576	2,576	1.7	0.6	0.6	0.6
11	15	0.71	0.24	296	369	369	369	0.2	0.1	0.1	0.1
12	20	0.64	0.22	482	542	575	575	0.3	0.1	0.1	0.1
13	15	0.71	0.30	1,285	1,424	1,495	1,494	0.9	0.4	0.4	0.4
14	20	0.64	0.22	762	802	802	802	0.5	0.2	0.2	0.2
15	15	0.71	0.24	2,428	2,553	2,553	2,553	1.7	0.6	0.6	0.6
16	30	0.58	0.24	5,753	6,657	7,580	7,561	3.3	1.6	1.8	1.8
17	25	0.60	0.20	14,437	29,681	28,403	28,428	8.7	5.8	5.5	5.5
18	15	0.71	0.24	648	1,014	1,273	1,267	0.5	0.2	0.3	0.3
19	15	0.71	0.24	665	706	901	897	0.5	0.2	0.2	0.2
20	15	0.71	0.24	1,038	1,127	1,521	1,513	0.7	0.3	0.4	0.4
21	15	0.71	0.24	2,119	3,892	3,195	3,209	1.5	0.9	0.8	0.8
22	15	0.71	0.24	931	1,393	1,659	1,654	0.7	0.3	0.4	0.4
23	20	0.64	0.22	5,171	6,278	8,021	7,986	3.3	1.4	1.7	1.7
24	20	0.64	0.22	366	386	437	436	0.2	0.1	0.1	0.1
					Total Daily NOx Emissions (kg/day):			49.93	22.49	23.88	23.85

*Mitigation assumes an 2% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE B-4
IDLING VOCs EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

Wynn Everett Casino

Existing/No-Build

2013	4.93	gram VOC/hour	0.00137	gram VOC/hour	K Factor PM: 0.100
2023	3.55	gram VOC/hour	0.00099	gram VOC/hour	

Move	Peak Period	Existing Delay (Sec)	Existing Volume (veh/hr)	Existing Idling (sec/hr)	2023 No-Build Delay (Sec)	2023 No-Build Volume (veh/hr)	2023 No-Build Idling (sec/hr)	Existing VOC (gram/hr)	2023 No-Bld VOC (gram/hr)	Existing VOC (ton/yr)	2023 No-Bld VOC (ton/yr)	Existing VOC (kg/day)	2023 No-Bld VOC (kg/day)
7. Beacham Street/Broadway (Rt 99)	PM	104.7	829	**86,796**	191.3	1151	**220,186**	119	217	0.5	0.9	1.2	2.2
13 Norwood St./Chelsea St./Broadway (Rt	PM	37.3	863	**32,190**	63.9	944	**60,322**	44	60	0.2	0.2	0.4	0.6
16 Ferry St./Broadway (Rt 99)	PM	78.9	1179	**93,023**	439.9	1698	**746,950**	127	737	0.5	3.0	1.3	7.4
17. McKinley St./Cameron St/Rt. 99/Lynn St.	PM	50.5	606	**30,603**	66.8	724	**48,363**	42	48	0.2	0.2	0.4	0.5
21. Revere Beach Parkway/Garvey St./ 2nd St.	PM	39.5	1583	**62,529**	67.4	1879	**126,645**	86	125	0.3	0.5	0.9	1.2
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	43.2	1655	**71,496**	67.4	2208	**148,819**	98	147	0.4	0.6	1.0	1.5
29. Revere Beach Parkway/Rt 16/Washington St.	PM	54.8	1668	**91,406**	89.2	2120	**189,104**	125	187	0.5	0.8	1.3	1.9
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	74.2	2045	**151,739**	110.1	2339	**257,524**	208	254	0.8	1.0	2.1	2.5
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	69.2	89	**6,159**	66.1	109	**7,205**	8	7	0.0	0.0	0.1	0.1
32d. Beach St/Everett St/Rt 1A/Rt 16/Rt 60	PM	89.3	1297	**115,822**	111.4	2103	**234,274**	159	231	0.6	0.9	1.6	2.3
34 Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	38.5	1042	**40,117**	53.6	1256	**67,322**	55	66	0.2	0.3	0.5	0.7
35 Central Ave/Medford St./Fellsway	PM	105.7	1759	**185,926**	162.3	2255	**365,987**	255	361	1.0	1.5	2.5	3.6
38. Harvard St/Mystic Ave. (Rt 38)	PM	63.7	1649	**105,041**	72.6	1841	**133,657**	144	132	0.6	0.5	1.4	1.3
39. Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	42.5	1076	**45,730**	72.1	1363	**98,272**	63	97	0.3	0.4	0.6	1.0
42a MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	54.8	1085	**59,458**	88.6	1502	**133,077**	81	131	0.3	0.5	0.8	1.3
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	30.1	2196	**66,100**	74.4	3272	**243,437**	91	240	0.4	1.0	0.9	2.4
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	89.1	942	**83,932**	122.7	1138	**139,633**	115	138	0.5	0.6	1.1	1.4
46 I-93 Ramps/ Mystic Ave (Rt 38)	PM	117.4	1579	**185,375**	191.3	1902	**363,853**	183	359	0.7	1.4	1.8	3.6
47a Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	32.1	962	**30,880**	71.8	1765	**126,727**	42	125	0.2	0.5	0.4	1.3
47b Broadway/ McGrath Highway	PM	106.2	510	**54,162**	126.1	564	**71,120**	74	70	0.3	0.3	0.7	0.7
49 Broadway/ McGrath Highway	PM	104.3	2298	**239,681**	145.6	2712	**394,867**	328	390	1.3	1.6	3.3	3.9
53d. Main St./Rutherford Ave (Rt 99)	PM	154.5	1846	**285,207**	59.2	1497	**88,622**	391	87	1.6	0.4	3.9	0.9
57 Monsignor O'Brien HW/Land Blvd/Charlestown Ave	PM	151.7	2237	339,353	274.8	3068	**843,086**	465	832	1.9	3.3	4.6	8.3
									Total:	13.3	20.3	33.0	50.4

TABLE B-4
IDLING VOCs EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

2,123,373 4,265,965
2.00905159 3,303 5,042 **1.526282515**

Build/Build with Mitigation

2023	3.55	gram VOC/hour	0.00099	gram VOC/hour	K Factor PM:	0.100

		2023 Build			2023 Build with Mitigation			2023 Build	2023 Bld w/Mit.	2023 Build	2023 Bld w/Mit.	2023 Build	2023 Bld w/Mit.
Move	Peak Period	Delay (Sec)	Volume (veh/hr)	Idling (sec/hr)	Delay (Sec)	Volume (veh/hr)	Idling (sec/hr)	VOC (gram/hr)	VOC (gram/hr)	VOC (ton/yr)	VOC (ton/yr)	VOC (kg/day)	VOC (kg/day)
7. Beacham Street/Broadway (Rt.99)	PM	263.4	1445	**380,613**	163.5	1569	**256,532**	376	253	1.5	1.0	3.8	2.5
13. Norwood St./Chelsea St./Broadway (Rt 99)	PM	80.0	1004	**80,320**	80.0	1004	**80,320**	79	79	0.3	0.3	0.8	0.8
16. (S) Ferry St./Broadway (Rt 99)	PM	642.6	1830	**1,175,958**	642.6	1830	**1,175,958**	1,160	1,160	4.7	4.7	11.6	11.6
17. McKinley St./Cameron St/Rt. 99/Lynn St.	PM	70.0	738	**51,660**	70.0	738	**51,660**	51	51	0.2	0.2	0.5	0.5
21. Revere Beach Parkway/Garvey St./ 2nd St.	PM	76.9	2000	**153,800**	76.9	2000	**153,800**	152	152	0.6	0.6	1.5	1.5
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	75.7	2306	**174,564**	75.7	2306	**174,564**	172	172	0.7	0.7	1.7	1.7
29. Revere Beach Parkway/Rt 16/Washington St.	PM	107.7	2297	**247,387**	76.0	2141	**162,716**	244	161	1.0	0.6	2.4	1.6
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	118.4	2711	**320,982**	118.4	2711	**320,982**	317	317	1.3	1.3	3.2	3.2
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	64.7	231	**14,946**	64.7	231	**14,946**	15	15	0.1	0.1	0.1	0.1
32d. Beach St/Everett St/Rt 1A/Rt 16/Rt 60 South Intersection	PM	111.3	1595	**177,524**	111.3	1595	**177,524**	175	175	0.7	0.7	1.8	1.8
34. Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	55.7	989	**55,087**	55.7	989	**55,087**	54	54	0.2	0.2	0.5	0.5
35. Central Ave/Medford St./Fellsway	PM	164.6	2269	**373,477**	164.6	2269	**373,477**	369	369	1.5	1.5	3.7	3.7
38. Harvard St/Mystic Ave. (Rt 38)	PM	74.7	1846	**137,896**	74.7	1846	**137,896**	136	136	0.5	0.5	1.4	1.4
39. Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	73.7	1497	**110,329**	73.7	1497	**110,329**	109	109	0.4	0.4	1.1	1.1
42a. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	102.5	1601	**164,103**	102.5	1601	**164,103**	162	162	0.7	0.7	1.6	1.6
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	83.1	3391	**281,792**	83.1	3391	**281,792**	278	278	1.1	1.1	2.8	2.8
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	122.7	1138	**139,633**	122.7	1138	**139,633**	138	138	0.6	0.6	1.4	1.4
46. I-93 Ramps/ Mystic Ave (Rt 38)	PM	191.3	1902	**363,853**	191.3	1902	**363,853**	359	359	1.4	1.4	3.6	3.6
47a. Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	72.0	1738	**125,136**	72.0	1738	**125,136**	123	123	0.5	0.5	1.2	1.2
47b. Broadway/ McGrath Highway	PM	126.1	564	**71,120**	126.1	564	**71,120**	70	70	0.3	0.3	0.7	0.7
49. Broadway/ McGrath Highway	PM	145.6	2712	**394,867**	145.6	2712	**394,867**	390	390	1.6	1.6	3.9	3.9
53d. Main St./Rutherford Ave (Rt 99)	PM	73.2	1986	**145,375**	73.2	1986	**145,375**	143	143	0.6	0.6	1.4	1.4
57. Monsignor O'Brien HW/Land Blvd/Charlestown Ave.	PM	274.8	3068	**843,086**	274.8	3068	**843,086**	832	832	3.3	3.3	8.3	8.3
									Total:	23.7	22.9	59.0	57.0

Summary of Emissions

Case	VOC (ton/year)	VOC (kg/day)	VOC (ton/day)
2013 Existing	13.3	33.0	0.036
2023 No-Build	20.3	50.4	0.056
2023 Build	23.7	59.0	0.065
2017 Build with Mitigation	22.9	57.0	0.063

Annual emission = peak weekday afternoon traffic emissions *(1/K)*365; where K = traffic K factor equal to peak-hour traffic/24-hour traffic

TABLE B-5
IDLING NOx EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

Wynn Everett Casino

Existing/No-Build

2013	2.80	gram NOx/hour	0.00078	gram NOx/sec	K Factor PM.	0.100
2023	1.01	gram NOx/hour	0.00028	gram NOx/sec		

Move	Peak Period	Existing Delay (Sec)	Existing Volume (veh/hr)	Existing Idling (sec/hr)	2023 No-Build Delay (Sec)	2023 No-Build Volume (veh/hr)	2023 No-Build Idling (sec/hr)	Existing NOx (gram/hr)	2023 No-Bld NOx (gram/hr)	Existing NOx (ton/yr)	2023 No-Bld NOx (ton/yr)	Existing NOx (kg/day)	2023 No-Bld NOx (kg/day)
7 Beacham Street/Broadway (Rt.99)	PM	104.7	829	**86,796**	191.3	1151	**220,186**	68	61	0.3	0.2	0.7	0.6
13. Norwood St./Chelsea St./Broadway (Rt	PM	37.3	863	**32,190**	63.9	944	**60,322**	25	17	0.1	0.1	0.3	0.2
16. Ferry St./Broadway (Rt 99)	PM	78.9	1179	**93,023**	439.9	1698	**746,950**	72	209	0.3	0.8	0.7	2.1
17. McKinley St./Cameron St/Rt. 99/Lynn St.	PM	50.5	606	**30,603**	66.8	724	**48,363**	24	14	0.1	0.1	0.2	0.1
21. Revere Beach Parkway/Garvey St./ 2nd St	PM	39.5	1583	**62,529**	67.4	1879	**126,645**	49	35	0.2	0.1	0.5	0.4
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	43.2	1655	**71,496**	67.4	2208	**148,819**	56	42	0.2	0.2	0.6	0.4
29. Revere Beach Parkway/Rt 16/Washington St.	PM	54.8	1668	**91,406**	89.2	2120	**189,104**	71	53	0.3	0.2	0.7	0.5
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	74.2	2045	**151,739**	110.1	2339	**257,524**	118	72	0.5	0.3	1.2	0.7
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	69.2	89	**6,159**	66.1	109	**7,205**	5	2	0.0	0.0	0.0	0.0
32d. Beach St/Everett St/Rt 1A/Rt 16/Rt 60	PM	89.3	1297	**115,822**	111.4	2103	**234,274**	90	65	0.4	0.3	0.9	0.7
34. Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	38.5	1042	**40,117**	53.6	1256	**67,322**	31	19	0.1	0.1	0.3	0.2
35. Central Ave/Medford St./Fellsway	PM	105.7	1759	**185,926**	162.3	2255	**365,987**	145	102	0.6	0.4	1.4	1.0
38. Harvard St/Mystic Ave. (Rt 38)	PM	63.7	1649	**105,041**	72.6	1841	**133,657**	82	37	0.3	0.1	0.8	0.4
39 Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	42.5	1076	**45,730**	72.1	1363	98,272	36	27	0.1	0.1	0.4	0.3
42a. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	54.8	1085	**59,458**	88.6	1502	**133,077**	46	37	0.2	0.1	0.5	0.4
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	30.1	2196	**66,100**	74.4	3272	**243,437**	51	68	0.2	0.3	0.5	0.7
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	89.1	942	**83,932**	122.7	1138	**139,633**	65	39	0.3	0.2	0.7	0.4
46. I-93 Ramps/ Mystic Ave (Rt 38)	PM	117.4	1579	**185,375**	191.3	1902	**363,853**	52	102	0.2	0.4	0.5	1.0
47a. Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	32.1	962	**30,880**	71.8	1765	**126,727**	24	35	0.1	0.1	0.2	0.4
47b. Broadway/ McGrath Highway	PM	106.2	510	**54,162**	126.1	564	**71,120**	42	20	0.2	0.1	0.4	0.2
49. Broadway/ McGrath Highway	PM	104.3	2298	**239,681**	145.6	2712	**394,867**	187	110	0.8	0.4	1.9	1.1
53d. Main St./Rutherford Ave (Rt 99)	PM	154.5	1846	**285,207**	59.2	1497	**88,622**	222	25	0.9	0.1	2.2	0.2
57. Monsignor O'Brien HW/Land Blvd/Charlestown Ave	PM	151.7	2237	**339,353**	274.8	3068	**843,086**	264	235	1.1	0.9	2.6	2.4
									Total:	7.3	5.7	18.2	14.3

TABLE B-5
IDLING NOx EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

Build/Build with Mitigation

2023	1.01	gram NOx/hour	0.00028	gram NOx/sec	K Factor PM:	0.100

Move	Peak Period	2023 Build Delay (Sec)	2023 Build Volume (veh/hr)	2023 Build Idling (sec/hr)	2023 Build with Mitigation Delay (Sec)	2023 Build with Mitigation Volume (veh/hr)	2023 Build with Mitigation Idling (sec/hr)	2023 Build NOx (gram/hr)	2023 Bld w/Mit. NOx (gram/hr)	2023 Build NOx (ton/yr)	2023 Bld w/Mit. NOx (ton/yr)	2023 Build NOx (kg/day)	2023 Bld w/Mit. NOx (kg/day)
7. Beacham Street/Broadway (Rt 99)	PM	263.4	1445	**380,613**	163.5	1569	**256,532**	106	72	0.4	0.3	1.1	0.7
13. Norwood St./Chelsea St./Broadway (Rt 99)	PM	80.0	1004	**80,320**	80.0	1004	**80,320**	22	22	0.1	0.1	0.2	0.2
16. (S) Ferry St./Broadway (Rt 99)	PM	642.6	1830	**1,175,958**	642.6	1830	**1,175,958**	328	328	1.3	1.3	3.3	3.3
17. McKinley St./Cameron St/Rt. 99/Lynn St.	PM	70.0	738	**51,660**	70.0	738	**51,660**	14	14	0.1	0.1	0.1	0.1
21. Revere Beach Parkway/Garvey St./ 2nd St.	PM	76.9	2000	**153,800**	76.9	2000	**153,800**	43	43	0.2	0.2	0.4	0.4
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	75.7	2306	**174,564**	75.7	2306	**174,564**	49	49	0.2	0.2	0.5	0.5
29. Revere Beach Parkway/Rt 16/Washington St.	PM	107.7	2297	**247,387**	76.0	2141	**162,716**	69	45	0.3	0.2	0.7	0.5
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	118.4	2711	**320,982**	118.4	2711	**320,982**	90	90	0.4	0.4	0.9	0.9
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	64.7	231	**14,946**	64.7	231	**14,946**	4	4	0.0	0.0	0.0	0.0
32d Beach St/Everett St/Rt 1A/Rt 16/Rt 60 South Intersection	PM	111.3	1595	**177,524**	111.3	1595	**177,524**	50	50	0.2	0.2	0.5	0.5
34. Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	55.7	989	**55,087**	55.7	989	**55,087**	15	15	0.1	0.1	0.2	0.2
35. Central Ave/Medford St./Fellsway	PM	164.6	2269	**373,477**	164.6	2269	**373,477**	104	104	0.4	0.4	1.0	1.0
38. Harvard St/Mystic Ave. (Rt 38)	PM	74.7	1846	**137,896**	74.7	1846	**137,896**	38	38	0.2	0.2	0.4	0.4
39. Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	73.7	1497	**110,329**	73.7	1497	**110,329**	31	31	0.1	0.1	0.3	0.3
42a. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	102.5	1601	**164,103**	102.5	1601	**164,103**	46	46	0.2	0.2	0.5	0.5
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	83.1	3391	**281,792**	83.1	3391	**281,792**	79	79	0.3	0.3	0.8	0.8
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	122.7	1138	**139,633**	122.7	1138	**139,633**	39	39	0.2	0.2	0.4	0.4
46. I-93 Ramps/ Mystic Ave (Rt 38)	PM	191.3	1902	**363,853**	191.3	1902	**363,853**	102	102	0.4	0.4	1.0	1.0
47a. Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	72.0	1738	**125,136**	72.0	1738	**125,136**	35	35	0.1	0.1	0.3	0.3
47b. Broadway/ McGrath Highway	PM	126.1	564	**71,120**	126.1	564	**71,120**	20	20	0.1	0.1	0.2	0.2
49. Broadway/ McGrath Highway	PM	145.6	2712	**394,867**	145.6	2712	**394,867**	110	110	0.4	0.4	1.1	1.1
53d. Main St./Rutherford Ave (Rt 99)	PM	73.2	1986	**145,375**	73.2	1986	**145,375**	41	41	0.2	0.2	0.4	0.4
57. Monsignor O'Brien HW/Land Blvd/Charlestown Ave	PM	274.8	3068	**843,086**	274.8	3068	**843,086**	235	235	0.9	0.9	2.4	2.4
									Total:	6.7	6.5	16.7	16.1

Summary of Emissions

Case	NOx (ton/year)	NOx (kg/day)	NOx (ton/day)
2013 Existing	7.3	18.2	0.020
2023 No-Build	5.7	14.3	0.016
2023 Build	6.7	16.7	0.018
2023 Build with Mitigation	6.5	16.1	0.018

Annual emission = peak weekday afternoon traffic emissions *(1/K)*365; where K = traffic K factor equal to peak-hour traffic/24-hour traffic

PART B

MOBILE6.2 MODEL OUTPUT

Pages	Scenario
10 - 17	Year 2013 Existing VOC, NO_x and CO_2
18 - 24	Year 2023 Build and No-Build VOC, NO_x and CO_2

```
*****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                  *
* Input file: 3745_13.INP (file 1, run 1).                    *
*****************************************************************************
* *** Summer 2013 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00     MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: 09NEWIM.D
* 15 Year Exemption Age
* New Annual OBD Exhaust I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Exhaust I/M program for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
* New Annual OBD Evap I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Evap I/M program for for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
 M601 Comment:
          User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

 Reading User Supplied Tier2 Exhaust bin phase-in fractions

   Data read from file: LEV2EXH.D


 Reading User Supplied Tier2 EVAP phase-in fractions

   Data read from file: LEV2EVAP.D
```

Reading User Supplied Tier2 50K certification standards

Data read from file: LEV2CERT.D

M616 Comment:
User has supplied post-1999 sulfur levels.
M614 Comment:
User supplied diesel sale fractions.

* #
* 2013 - Summer at 2.5 mph
* File 1, Run 1, Scenario 1.
* #
M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
there are no sales for vehicle class HDGV8b
HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2
Composite Emission Factors (g/mi):										
Composite VOC :	2.353	1.756	1.968	1.816	2.729	0.526	0.430	0.962	12.00	1.973
Composite NOX :	0.624	0.510	0.744	0.576	0.671	0.685	0.393	6.697	1.12	1.121
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

* #
* 2013 - Summer at 15 mph
* File 1, Run 1, Scenario 2.
* #
M583 Warning:
The user supplied arterial average speed of 15.0
will be used for all hours of the day. 100% of VMT

has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2
Composite Emission Factors (g/mi):										
Composite VOC :	0.410	0.337	0.410	0.358	0.588	0.335	0.266	0.533	4.48	0.412
Composite NOX :	0.334	0.307	0.451	0.347	0.758	0.447	0.256	4.374	1.01	0.707
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

* #
* 2013 - Summer at 20 mph
* File 1, Run 1, Scenario 3.
* #

M583 Warning:
The user supplied arterial average speed of 20.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						

	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2

Composite Emission Factors (g/mi):

Composite VOC :	0.360	0.291	0.354	0.309	0.475	0.293	0.230	0.437	4.03	0.355
Composite NOX :	0.297	0.280	0.413	0.317	0.793	0.401	0.229	3.920	1.06	0.641
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

*#########################
* 2013 - Summer at 25 mph
* File 1, Run 1, Scenario 4.
*#########################
M583 Warning:
The user supplied arterial average speed of 25.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2

Composite Emission Factors (g/mi):

Composite VOC :	0.332	0.269	0.326	0.285	0.408	0.262	0.203	0.367	3.76	0.324
Composite NOX :	0.274	0.263	0.390	0.299	0.828	0.372	0.212	3.635	1.12	0.600
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

*#########################
* 2013 - Summer at 30 mph
* File 1, Run 1, Scenario 5.
*#########################
M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

```
LEV phase-in data read from file MA_LEV2.D
              Calendar Year:  2013
                    Month:  July
                 Altitude:  Low
       Minimum Temperature:  70.4 (F)
       Maximum Temperature:  93.7 (F)
        Absolute Humidity:   75. grains/lb
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  Yes
         Evap I/M Program:  Yes
             ATP Program:  No
         Reformulated Gas:  Yes

    Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
          GVWR:             <6000    >6000     (All)
                   ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
  VMT Distribution:   0.2982   0.4117   0.1619          0.0368   0.0002   0.0015   0.0858   0.0038   1.0000
Fuel Economy (mpg):     24.1     18.5     14.2     17.1     9.9     32.9     18.4     7.3     50.0     16.2
 ------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.314    0.255    0.309    0.270    0.362   0.238    0.183    0.314     3.55    0.303
   Composite NOX :    0.258    0.252    0.374    0.286    0.863   0.357    0.203    3.486     1.17    0.577
   Composite CO2 :  368.0    479.1    624.1    520.0    894.8   309.4    554.2   1399.7    177.4   562.71
 ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2013 - Summer at 35 mph
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of 35.0
         will be used for all hours of the day.  100% of VMT
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
              Calendar Year:  2013
                    Month:  July
                 Altitude:  Low
       Minimum Temperature:  70.4 (F)
       Maximum Temperature:  93.7 (F)
        Absolute Humidity:   75. grains/lb
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  Yes
         Evap I/M Program:  Yes
             ATP Program:  No
         Reformulated Gas:  Yes

    Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
          GVWR:             <6000    >6000     (All)
                   ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
  VMT Distribution:   0.2982   0.4117   0.1619          0.0368   0.0002   0.0015   0.0858   0.0038   1.0000
Fuel Economy (mpg):     24.1     18.5     14.2     17.1     9.9     32.9     18.4     7.3     50.0     16.2
 ------------------------------------------------------------------------------------------------------------
```

Composite Emission Factors (g/mi):

Composite VOC :	0.301	0.245	0.297	0.259	0.331	0.221	0.168	0.275	3.39	0.287
Composite NOX :	0.248	0.246	0.367	0.280	0.897	0.353	0.201	3.456	1.22	0.570
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

---

* #
* 2013 - Summer at 40 mph
* File 1, Run 1, Scenario 7.
* #

M583 Warning:
The user supplied arterial average speed of 40.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2

Composite Emission Factors (g/mi):

Composite VOC :	0.293	0.240	0.290	0.254	0.308	0.208	0.157	0.247	3.28	0.278
Composite NOX :	0.252	0.251	0.371	0.285	0.932	0.362	0.206	3.542	1.24	0.582
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

---

* #
* 2013 - Summer at 45 mph
* File 1, Run 1, Scenario 8.
* #

M583 Warning:
The user supplied arterial average speed of 45.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July

Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2
Composite Emission Factors (g/mi):										
Composite VOC :	0.286	0.235	0.285	0.249	0.291	0.199	0.149	0.226	3.21	0.271
Composite NOX :	0.256	0.256	0.377	0.290	0.967	0.384	0.219	3.753	1.27	0.606
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

* #
* 2013 - Summer at 50 mph
* File 1, Run 1, Scenario 9.
* #

M583 Warning:
The user supplied arterial average speed of 50.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2013
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2982	0.4117	0.1619		0.0368	0.0002	0.0015	0.0858	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.9	18.4	7.3	50.0	16.2
Composite Emission Factors (g/mi):										
Composite VOC :	0.280	0.232	0.280	0.245	0.279	0.193	0.144	0.212	3.19	0.265
Composite NOX :	0.261	0.262	0.384	0.296	1.002	0.421	0.240	4.114	1.34	0.643
Composite CO2 :	368.0	479.1	624.1	520.0	894.8	309.4	554.2	1399.7	177.4	562.71

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                  *
* Input file: 3745_23.INP (file 1, run 1).                   *
***************************************************************************
* *** Summer 2023 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
           1.00    MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: 09NEWIM.D
* 15 Year Exemption Age
* New Annual OBD Exhaust I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Exhaust I/M program for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
* New Annual OBD Evap I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Evap I/M program for for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
 M601 Comment:
          User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

 Reading User Supplied Tier2 Exhaust bin phase-in fractions

   Data read from file: LEV2EXH.D


 Reading User Supplied Tier2 EVAP phase-in fractions

   Data read from file: LEV2EVAP.D
```

Reading User Supplied Tier2 50K certification standards

Data read from file: LEV2CERT.D

M616 Comment:
User has supplied post-1999 sulfur levels.
M614 Comment:
User supplied diesel sale fractions.

* #
* 2023 - Summer at 2.5 mph
* File 1, Run 1, Scenario 1.
* #

M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning:
there are no sales for vehicle class HDGV8b
HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0
Composite Emission Factors (g/mi):										
Composite VOC :	1.590	1.359	1.408	1.373	1.641	0.161	0.203	0.766	11.46	1.421
Composite NOX :	0.313	0.263	0.358	0.290	0.191	0.158	0.107	1.528	1.12	0.402
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 15 mph
* File 1, Run 1, Scenario 2.
* #

M583 Warning:
The user supplied arterial average speed of 15.0
will be used for all hours of the day. 100% of VMT

has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0
Composite Emission Factors (g/mi):										
Composite VOC :	0.245	0.241	0.275	0.250	0.333	0.103	0.124	0.424	3.94	0.280
Composite NOX :	0.158	0.154	0.209	0.169	0.216	0.103	0.069	0.979	1.01	0.241
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 20 mph
* File 1, Run 1, Scenario 3.
* #

M583 Warning:
The user supplied arterial average speed of 20.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						

VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0

Composite Emission Factors (g/mi):

Composite VOC :	0.209	0.203	0.233	0.211	0.265	0.090	0.106	0.348	3.50	0.236
Composite NOX :	0.138	0.139	0.189	0.153	0.226	0.093	0.062	0.872	1.06	0.218
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 25 mph
* File 1, Run 1, Scenario 4.
* #

M583 Warning:
The user supplied arterial average speed of 25.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0

Composite Emission Factors (g/mi):

Composite VOC :	0.190	0.185	0.213	0.193	0.225	0.080	0.093	0.292	3.22	0.213
Composite NOX :	0.126	0.130	0.177	0.144	0.236	0.086	0.058	0.805	1.12	0.203
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 30 mph
* File 1, Run 1, Scenario 5.
* #

M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0

Composite Emission Factors (g/mi):

	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Composite VOC :	0.177	0.174	0.201	0.181	0.198	0.073	0.084	0.250	3.02	0.197
Composite NOX :	0.118	0.124	0.169	0.137	0.246	0.082	0.055	0.769	1.17	0.195
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 35 mph
* File 1, Run 1, Scenario 6.
* #

M583 Warning:
The user supplied arterial average speed of 35.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0

Composite Emission Factors (g/mi):										
Composite VOC :	0.167	0.166	0.192	0.173	0.178	0.068	0.077	0.219	2.86	0.185
Composite NOX :	0.113	0.121	0.165	0.133	0.256	0.082	0.055	0.762	1.22	0.191
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

---

* #
* 2023 - Summer at 40 mph
* File 1, Run 1, Scenario 7.
* #

M583 Warning:
The user supplied arterial average speed of 40.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0

Composite Emission Factors (g/mi):										
Composite VOC :	0.160	0.161	0.187	0.168	0.163	0.064	0.071	0.196	2.74	0.178
Composite NOX :	0.114	0.123	0.167	0.136	0.266	0.084	0.056	0.783	1.24	0.195
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

---

* #
* 2023 - Summer at 45 mph
* File 1, Run 1, Scenario 8.
* #

M583 Warning:
The user supplied arterial average speed of 45.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July

Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0
Composite Emission Factors (g/mi):										
Composite VOC :	0.154	0.157	0.183	0.165	0.152	0.061	0.067	0.180	2.68	0.172
Composite NOX :	0.115	0.126	0.171	0.139	0.276	0.089	0.059	0.832	1.27	0.202
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

* #
* 2023 - Summer at 50 mph
* File 1, Run 1, Scenario 9.
* #
M583 Warning:
The user supplied arterial average speed of 50.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2023
Month: July
Altitude: Low
Minimum Temperature: 70.4 (F)
Maximum Temperature: 93.7 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: No
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2605	0.4380	0.1723		0.0372	0.0002	0.0016	0.0867	0.0036	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.0	9.9	32.4	18.4	7.3	50.0	16.0
Composite Emission Factors (g/mi):										
Composite VOC :	0.149	0.154	0.180	0.161	0.144	0.059	0.065	0.168	2.66	0.167
Composite NOX :	0.117	0.129	0.175	0.142	0.285	0.097	0.065	0.918	1.34	0.212
Composite CO2 :	368.0	479.4	624.6	520.4	893.9	314.1	554.0	1397.5	177.4	569.38

PART C

GREENHOUSE GAS EMISSION CALCULATIONS

TABLE B-6
IDLING CO2 EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

Wynn Everett Casino

Existing/No-Build

2013	1407	gram CO2/hour	0.391	gram CO2/hour	K Factor PM: 0.100
2023	1423	gram CO2/hour	0.395	gram CO2/hour	

Move	Peak Period	Existing Delay (Sec)	Existing Volume (veh/hr)	Existing Idling (sec/hr)	2023 No-Build Delay (Sec)	2023 No-Build Volume (veh/hr)	2023 No-Build Idling (sec/hr)	Existing CO2 (gram/hr)	2023 No-Bld CO2 (gram/hr)	Existing CO2 (ton/yr)	2023 No-Bld CO2 (ton/yr)	Existing CO2 (kg/day)	2023 No-Bld CO2 (kg/day)
7. Beacham Street/Broadway (Rt.99)	PM	104.7	829	**86,796**	191.3	1151	**220,186**	33,917	87,062	136.3	350.0	339.2	870.6
13 Norwood St./Chelsea St./Broadway (Rt	PM	37.3	863	**32,190**	63.9	944	**60,322**	12,579	23,851	50.6	95.9	125.8	238.5
16. Ferry St./Broadway (Rt 99)	PM	78.9	1179	**93,023**	439.9	1698	**746,950**	36,351	295,346	146.1	1187.2	363.5	2,953.5
17 McKinley St./Cameron St/Rt. 99/Lynn St.	PM	50.5	606	**30,603**	66.8	724	**48,363**	11,959	19,123	48.1	76.9	119.6	191.2
21. Revere Beach Parkway/Garvey St./ 2nd St.	PM	39.5	1583	**62,529**	67.4	1879	**126,645**	24,434	50,076	98.2	201.3	244.3	500.8
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	43.2	1655	**71,496**	67.4	2208	**148,819**	27,939	58,844	112.3	236.5	279.4	588.4
29 Revere Beach Parkway/Rt 16/Washington St.	PM	54.8	1668	**91,406**	89.2	2120	**189,104**	35,719	74,772	143.6	300.6	357.2	747.7
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	74.2	2045	**151,739**	110.1	2339	**257,524**	59,295	101,826	238.4	409.3	593.0	1,018.3
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	69.2	89	**6,159**	66.1	109	**7,205**	2,407	2,849	9.7	11.5	24.1	28.5
32d. Beach St/Everett St/Rt 1A/Rt 16/Rt 60	PM	89.3	1297	**115,822**	111.4	2103	**234,274**	45,260	92,633	181.9	372.4	452.6	926.3
34. Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	38.5	1042	**40,117**	53.6	1256	**67,322**	15,677	26,619	63.0	107.0	156.8	266.2
35. Central Ave/Medford St./Fellsway	PM	105.7	1759	**185,926**	162.3	2255	**365,987**	72,655	144,712	292.1	581.7	726.5	1,447.1
38. Harvard St/Mystic Ave (Rt 38)	PM	63.7	1649	**105,041**	72.6	1841	**133,657**	41,047	52,848	165.0	212.4	410.5	528.5
39 Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	42.5	1076	**45,730**	72.1	1363	**98,272**	17,870	38,857	71.8	156.2	178.7	388.6
42a. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	54.8	1085	**59,458**	88.6	1502	**133,077**	23,234	52,619	93.4	211.5	232.3	526.2
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	30.1	2196	**66,100**	74.4	3272	**243,437**	25,830	96,256	103.8	386.9	258.3	962.6
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	89.1	942	**83,932**	122.7	1138	**139,633**	32,798	55,211	131.8	221.9	328.0	552.1
46. I-93 Ramps/ Mystic Ave (Rt 38)	PM	117.4	1579	**185,375**	191.3	1902	**363,853**	73,298	143,868	294.6	578.3	733.0	1,438.7
47a Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	32.1	962	**30,880**	71.8	1765	**126,727**	12,067	50,108	48.5	201.4	120.7	501.1
47b Broadway/ McGrath Highway	PM	106.2	510	**54,162**	126.1	564	**71,120**	21,165	28,121	85.1	113.0	211.6	281.2
49 Broadway/ McGrath Highway	PM	104.3	2298	**239,681**	145.6	2712	**394,867**	93,661	156,132	376.5	627.6	936.6	1,561.3
53d Main St./Rutherford Ave (Rt 99)	PM	154.5	1846	**285,207**	59.2	1497	**88,622**	111,451	35,042	448.0	140.9	1,114.5	350.4
57 Monsignor O'Brien HW/Land Blvd/Charlestown Ave	PM	151.7	2237	**339,353**	274.8	3068	**843,086**	132,609	333,359	533.1	1340.0	1,326.1	3,333.6
								Total:		3872.0	8120.6	9,632.2	20,201.3

TABLE B-6
IDLING CO_2 EMISSIONS CALCULATIONS
Wynn Everett Casino Project, Everett, MA

2,123,373

4,265,965
2.00905159

Build/Build with Mitigation

2023	1423	gram CO2/hour	0.39540	gram CO2/hour	K Factor PM: 0.100

Move	Peak Period	2023 Build Delay (Sec)	2023 Build Volume (veh/hr)	2023 Build Idling (sec/hr)	2023 Build with Mitigation Delay (Sec)	2023 Build with Mitigation Volume (veh/hr)	2023 Build with Mitigation Idling (sec/hr)	2023 Build CO2 (gram/hr)	2023 Bld w/Mit. CO2 (gram/hr)	2023 Build CO2 (ton/yr)	2023 Bld w/Mit. CO2 (ton/yr)	2023 Build CO2 (kg/day)	2023 Bld w/Mit. CO2 (kg/day)
7. Beacham Street/Broadway (Rt.99)	PM	263.4	1445	**380,613**	163.5	1569	**256,532**	150,495	101,433	605.0	407.7	1,505.0	1,014.3
13. Norwood St./Chelsea St./Broadway (Rt 99)	PM	80.0	1004	**80,320**	80.0	1004	**80,320**	31,759	31,759	127.7	127.7	317.6	317.6
16. (S) Ferry St./Broadway (Rt 99)	PM	642.6	1830	**1,175,958**	642.6	1830	**1,175,958**	464,977	464,977	1869.1	1869.1	4,649.8	4,649.8
17. McKinley St./Cameron St/Rt. 99/Lynn St.	PM	70.0	738	**51,660**	70.0	738	**51,660**	20,427	20,427	82.1	82.1	204.3	204.3
21. Revere Beach Parkway/Garvey St./ 2nd St.	PM	76.9	2000	**153,800**	76.9	2000	**153,800**	60,813	60,813	244.5	244.5	608.1	608.1
26. Revere Beach Parkway/Everett Ave. (Rt 16)	PM	75.7	2306	**174,564**	75.7	2306	**174,564**	69,023	69,023	277.5	277.5	690.2	690.2
29. Revere Beach Parkway/Rt 16/Washington St.	PM	107.7	2297	**247,387**	76.0	2141	**162,716**	97,817	64,338	393.2	258.6	978.2	643.4
30. Revere Beach Parkway Rt. 16/Webster Ave.	PM	118.4	2711	**320,982**	118.4	2711	**320,982**	126,917	126,917	510.2	510.2	1,269.2	1,269.2
32a. Beach St./ Rt 1A/Rt 16/ Rt 16/Rt 60 (Bell Circle)	PM	64.7	231	**14,946**	64.7	231	**14,946**	5,910	5,910	23.8	23.8	59.1	59.1
32d. Beach St/Everett St/Rt 1A/Rt 16/Rt 60 South Intersection	PM	111.3	1595	**177,524**	111.3	1595	**177,524**	70,193	70,193	282.2	282.2	701.9	701.9
34. Fellsway West (Rt 28)/Salem St. (Rt 60)	PM	55.7	989	**55,087**	55.7	989	**55,087**	21,782	21,782	87.6	87.6	217.8	217.8
35. Central Ave/Medford St./Fellsway	PM	164.6	2269	**373,477**	164.6	2269	**373,477**	147,674	147,674	593.6	593.6	1,476.7	1,476.7
38. Harvard St/Mystic Ave. (Rt 38)	PM	74.7	1846	**137,896**	74.7	1846	**137,896**	54,525	54,525	219.2	219.2	545.2	545.2
39. Harvard St/Mystic Valley Parkway/MVP SB Connector	PM	73.7	1497	**110,329**	73.7	1497	**110,329**	43,624	43,624	175.4	175.4	436.2	436.2
42a. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. East Intersection	PM	102.5	1601	**164,103**	102.5	1601	**164,103**	64,887	64,887	260.8	260.8	648.9	648.9
42b. MVP/Revere Beach Parkway/Fellsway/Middlesex Ave. West Intersection	PM	83.1	3391	**281,792**	83.1	3391	**281,792**	111,421	111,421	447.9	447.9	1,114.2	1,114.2
45. I-93 Ramps/Mystic Ave (Rt 38)	PM	122.7	1138	**139,633**	122.7	1138	**139,633**	55,211	55,211	221.9	221.9	552.1	552.1
46. I-93 Ramps/ Mystic Ave (Rt 38)	PM	191.3	1902	**363,853**	191.3	1902	**363,853**	143,868	143,868	578.3	578.3	1,438.7	1,438.7
47a. Mystic Ave (Rt38)/McGrath Highway (Rt 28)	PM	72.0	1738	**125,136**	72.0	1738	**125,136**	49,479	49,479	198.9	198.9	494.8	494.8
47b. Broadway/ McGrath Highway	PM	126.1	564	**71,120**	126.1	564	**71,120**	28,121	28,121	113.0	113.0	281.2	281.2
49. Broadway/ McGrath Highway	PM	145.6	2712	**394,867**	145.6	2712	**394,867**	156,132	156,132	627.6	627.6	1,561.3	1,561.3
53d. Main St./Rutherford Ave (Rt 99)	PM	73.2	1986	**145,375**	73.2	1986	**145,375**	57,482	57,482	231.1	231.1	574.8	574.8
57. Monsignor O'Brien HW/Land Blvd/Charlestown Ave.	PM	274.8	3068	**843,086**	274.8	3068	**843,086**	333,359	333,359	1340.0	1340.0	3,333.6	3,333.6
									Total:	9510.5	9178.7	23,659.0	22,833.5

Summary of Emissions

Case	CO2 (ton/year)	CO2 (kg/day)	CO2 (ton/day)
2013 Existing	3,872	9,632	10.6
2023 No-Build	8,121	20,201	22.2
2023 Build	9,510	23,659	26.1
2023 Build with Mitigation	9,179	22,834	25.1

Annual emission = peak weekday afternoon traffic emissions *(1/K)*365, where K = traffic K factor equal to peak-hour traffic/24-hour traffic

TABLE B-7
Mesoscale Study Area
Total Daily Volatile Organic Compound (CO_2) Emissions
Wynn Harbor Park Project

Link I.D.	MOBILE6.2 CO2 Emission Rate (gram/mile) 2013	2023	Vehicle Miles Traveled (VMT) (miles/day) 2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*	Mesoscale CO2 Emissions (kg/day) 2013 Existing	2023 No-Build	2023 Full Build w/o mitigation	2023 Full Build w/mitigation*
1	550.40	550.40	1,472	1,620	1,696	1,695	810.3	891.5	933.7	932.8
2	550.40	550.40	1,143	1,321	1,369	1,368	628.8	726.8	753.3	752.8
3	550.40	550.40	598	650	806	803	328.9	358.0	443.7	442.0
4	550.40	550.40	3,099	3,564	4,450	4,432	1,705.7	1,961.4	2,449.2	2,439.4
5	550.40	550.40	3,967	4,458	5,250	5,234	2,183.3	2,453.4	2,889.5	2,880.8
6	550.40	550.40	1,374	1,553	1,963	1,955	756.1	854.8	1,080.4	1,075.9
7	550.40	550.40	4,815	5,568	6,838	6,812	2,650.2	3,064.7	3,763.4	3,749.4
8	550.40	550.40	20,153	21,840	21,840	21,840	11,092.0	12,020.6	12,020.6	12,020.6
9	550.40	550.40	4,443	4,915	5,366	5,357	2,445.5	2,705.1	2,953.7	2,948.7
10	550.40	550.40	2,367	2,576	2,576	2,576	1,302.8	1,418.0	1,418.0	1,418.0
11	550.40	550.40	296	369	369	369	163.1	203.3	203.3	203.3
12	550.40	550.40	482	542	575	575	265.2	298.2	316.7	316.3
13	550.40	550.40	1,285	1,424	1,495	1,494	707.1	783.7	822.9	822.2
14	550.40	550.40	762	802	802	802	419.6	441.3	441.3	441.3
15	550.40	550.40	2,428	2,553	2,553	2,553	1,336.5	1,405.1	1,405.1	1,405.1
16	550.40	550.40	5,753	6,657	7,580	7,561	3,166.6	3,663.9	4,171.8	4,161.6
17	550.40	550.40	14,437	29,681	28,403	28,428	7,946.0	16,336.5	15,632.8	15,646.9
18	550.40	550.40	648	1,014	1,273	1,267	356.6	557.9	700.4	697.6
19	550.40	550.40	665	706	901	897	365.9	388.6	495.6	493.5
20	550.40	550.40	1,038	1,127	1,521	1,513	571.1	620.4	837.3	833.0
21	550.40	550.40	2,119	3,892	3,195	3,209	1,166.3	2,142.1	1,758.5	1,766.2
22	550.40	550.40	931	1,393	1,659	1,654	512.5	766.5	913.2	910.3
23	550.40	550.40	5,171	6,278	8,021	7,986	2,846.2	3,455.3	4,414.7	4,395.5
24	550.40	550.40	366	386	437	436	201.6	212.6	240.4	239.9
				Total Daily CO_2 Emissions (kg/day):			43,928.35	57,729.59	61,059.60	60,993.00

*Mitigation assumes an 2% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

Appendix D

Agreement to Award the Category 1 Gaming License in Region A to Wynn MA LLC

COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, ss. MASSACHUSETTS GAMING COMMISSION

In the Matter of:

Wynn MA, LLC

AGREEMENT TO AWARD THE CATEGORY 1 LICENSE IN REGION A TO WYNN MA, LLC

This instrument shall serve as an Agreement by the Massachusetts Gaming Commission (hereinafter, "Commission") to award the Category 1 gaming license in Region A (hereinafter, "license") to Wynn MA, LLC (hereinafter, "Wynn") and Wynn to accept the award of the license. Upon reviewing all of the applicable requirements of G.L c. 23K and 205 CMR, weighing Wynn's RFA-1 and RFA-2 applications, and considering information and comments submitted by the public and other interested individuals and groups, the Commission has determined that the license will be awarded to Wynn pursuant to the terms and conditions of this Agreement. By executing this Agreement, the Commission is hereby taking action pursuant to G.L. c.23K, §17(e) and 205 CMR 118.06(1)(d), and has determined that the license will be awarded by a vote of the Commission and accepted by Wynn on or after the Effective Date of the license as described in the *Summary of Conditions* attached hereto and incorporated herein.

Terms and Conditions

Gaming Establishment The gaming establishment will be as described in the *Decision Regarding the Determination of Premises of the Gaming Establishment for Mohegan Sun MA, LLC and Wynn MA, LLC* dated May 15, 2014 (Attached as Exhibit 1).

Term of the license The term of the license commences upon the Commission approval of the commencement of operation of the Gaming Establishment and continues for a period of 15 years thereafter.

Conditions The *Summary of Conditions* for Wynn MA, LLC approved by the Commission on DATE (Attached as Exhibit 2) is hereby incorporated into this Agreement by reference in its entirety.

SO ORDERED

MASSACHUSETTS GAMING COMMISSION

James F. McHugh, Commissioner

Bruce Stebbins, Commissioner

Gayle Cameron, Commissioner

Enrique Zuniga, Commissioner

ACCEPTED AND AGREED

WYNN MA, LLC

By: ______________________________

Title: SR. V.P., DEVELOPMENT

Dated: September 17, 2014

EXHIBIT 1

COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, ss. MASSACHUSETTS GAMING COMMISSION

In the Matter of:

The Determination of the Premises of the Gaming Establishment for which Mohegan Sun Massachusetts LLC Seeks Approval in its RFA-2 Application

The Determination of the Premises of the Gaming Establishment for which Wynn MA LLC Seeks Approval in its RFA-2 Application

DECISION REGARDING THE DETERMINATION OF PREMISES OF THE GAMING ESTABLISHMENT FOR MOHEGAN SUN MA, LLC AND WYNN MA, LLC

1. Introduction and Background

On December 31, 2013 applicants Mohegan Sun MA, LLC ("Mohegan") and Wynn MA, LLC ("Wynn") filed RFA-2 applications[1] with the Massachusetts Gaming Commission ("Commission"). Mohegan and Wynn are competing for the award of the sole Category 1 gaming license to be awarded by the Commission in Region A. Mohegan and Wynn are the only applicants in Region A that entered into host community agreements with Revere and Everett, respectively and were approved by a referendum vote in those communities.

Each applicant listed the City of Boston ("City") as a surrounding community, as defined in G.L. c. 23K, § 2,[2] in their RFA-2 application. However, on March 19, 2014, the City filed with the Commission a "Declaration" stating that the City was a host community to the Mohegan application and a Declaration stating that the City was a host community to the Wynn application. On April 3, 2014, in response to those Declarations, the Commission issued a notice of public meeting which included a process whereby the Commission would determine the

[1] RFA-2 applications are portions of an application for a gaming license that focus on the features and economic yield of an applicant's proposed gaming establishment. See 205 CMR 118 and 119. A separate portion of the application called an RFA-1 focuses on the applicant's suitability to hold a gaming license. See 205 CMR 111 and 115. Only applicants whom the Commission has found to be suitable may file the RFA-2 application.

[2] The term "surrounding communities" is defined by G.L. c.23K, §2 as "municipalities in proximity to a host community which the commission determines experience or are likely to experience impacts from the development or operation of a gaming establishment, including municipalities from which the transportation infrastructure provides ready access to an existing or proposed gaming establishment."

premises of the gaming establishment as defined in G.L. c. 23K, § 2[3] for the Mohegan and Wynn applications based upon their respective RFA-2 applications. A copy of the hearing notice is attached as Exhibit A. The Commission took that course because, under the statute, the location of those premises determines whether a municipality is or is not a host community. The Commission set May 1, 2014 as the date of the public meeting for the determinations.

Since its inception, the Commission has routinely offered members of the public an opportunity to comment on matters before the Commission in an effort to help shape the Commission's thinking and to ensure that the Commission reviews issues from a variety of angles. Consistent with that practice, the Commission requested the applicants, the City and any other interested persons to submit briefs and affidavits to the Commission on either or both of the two questions by April 17, 2014; reply briefs were due on April 24, 2014. The Commission requested that public comment be submitted in the form of briefs to ensure that the information was presented in a uniform, concise manner and ultimately in a format that the Commission determined would be most beneficial to it as it endeavored to make the determinations regarding the location of the premises. Briefs and/or reply briefs were submitted by Mohegan, Wynn, the City of Revere and an organization called No Eastie Casino. The City submitted a letter challenging the Commission's jurisdiction over the issue, alleging that the Commission's chairman should recuse himself from the deliberations and stating that the Commission should resolve some issues regarding the land in Everett where Wynn proposed to locate its establishment before resolving gaming establishment questions.

Pursuant to the process outlined in the Commission's notice of hearing, persons submitting a brief/reply brief were allowed to present to the Commission at the public meeting. On April 30, 2014, the Commission also invited the City to appear and present at the May 1 public hearing notwithstanding that the City did not submit a brief or reply brief. On May 1, 2014, the Commission granted the City's request for a one-week continuance of the meeting and moved it to May 8, 2014.

At the public hearing on May 8, 2014, oral presentations were made to the Commission by Mohegan, Wynn, the City of Revere, No Eastie Casino, and the City. At the close of the public hearing, the Commission deliberated and issued a decision in principle determining the premises of the gaming establishment for Mohegan and determining the premises of the gaming establishment for Wynn. It stated an intention to issue this written decision after review at its next public meeting.

2. Issues Presented

There are two issues before the Commission. Those issues are to:

[3] The term "gaming establishment" is defined by G.L. c.23K, §2 as "the premises approved under a gaming license which includes a gaming area and any other nongaming structure related to the gaming area and may include, but shall not be limited to, hotels, restaurants or other amenities."

1. Determine the premises of the gaming establishment for which Mohegan Sun Massachusetts LLC seeks approval in its RFA-2 application; and

2. Determine the premises of the gaming establishment for which Wynn MA LLC seeks approval in its RFA-2 application.

Based upon the briefs, reply briefs and public submissions received by the Commission, the presentations made to the Commission at the May 8, 2014 public hearing and the information provided to the Commission in the RFA-2 application submitted by Mohegan and by Wynn, the Commission makes the following findings:

The premises of the gaming establishment for which Mohegan seeks approval in its RFA-2 application consists of the components as shown on the site plan attached to this Determination as Exhibit B and as further discussed below. All of the premises of the gaming establishment for which Mohegan seeks approval in its RFA-2 application are located in the City of Revere.

The premises of the gaming establishment for which Wynn seeks approval in its RFA-2 application consists of the components as shown on the site plan attached to this Determination as Exhibit C and as further discussed below. All of the premises of the gaming establishment for which Wynn seeks approval in its RFA-2 application are located in the City of Everett.

3. Discussion

In accordance with G.L. c. 23K, §1 "the power and authority granted to the commission shall be construed as broadly as necessary for the implementation, administration and enforcement of [G.L. c.23K]." Further, "[t]he commission shall have all powers necessary or convenient to carry out and effectuate its purposes . . . ." G.L. c.23K, §4. "The commission may issue not more than 3 category 1 licenses" one each in Region A, Region B and Region C. G.L. c.23K, §19(a).

As part of the award of each gaming license, the Commission must determine what the premises of the gaming establishment are. That is, it must determine which premises will be subject to regulatory oversight by the Commission. The Commission's determination in this regard is required by G.L. c 23K, §2 which defines the "gaming establishment" as: "the premises approved under a gaming license which includes a gaming area[4] and any other nongaming structure related to the gaming area and may include, but shall not be limited to, hotels, restaurants or other amenities."

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[4] The term "gaming area" is defined by G.L. c. 23K, § 2 as "the portion of the premises of the gaming establishment in which or on which gaming is conducted."

Under G.L. c. 23K, §10(a), hotels are necessarily part of the gaming establishment.[5] Beyond that, though, by use of the term "may" in the definition of 'gaming establishment,' it is clear that the Legislature intended to provide the Commission great latitude in determining the components of the gaming establishment. The latitude was designed so that the Commission is able to include any element within the gaming establishment that it deems necessary to ensure proper regulation of the gaming licensee.

Once the gaming establishment is determined by the Commission, the question of whether a municipality is a host community or a surrounding community and thus entitled to rights pertaining to a host community or a surrounding community provided under G.L. c. 23K becomes clear and flows organically as a matter of law. Chapter 23K, §2 defines a host community as: "a municipality in which a gaming establishment is located or in which an applicant has proposed locating a gaming establishment." Chapter 23K, §2 defines surrounding communities as: "municipalities in close proximity to a host community which the commission determines experience or are likely to experience impacts from the development or operation of a gaming establishment, including municipalities from which the transportation infrastructure provides ready access to an existing or proposed gaming establishment." It is clear that the host community determination is a matter of geographic location of the gaming establishment while surrounding community status[6] is determined based by impacts.

a. <u>Mohegan briefs and presentations</u>

The Commission received briefs and an oral presentation from Mohegan, the City of Revere and No Eastie Casino, and an oral presentation from the City on the definition of the gaming establishment for which Mohegan seeks approval under its RFA-2 application. All of the written material received and reviewed by the Commission is available for public review on the Commission's website, <u>www.massgaming.com</u>.

The City argued that the gaming establishment for which Mohegan seeks approval includes the horse racing track owned and operated by Suffolk Downs. The City urged that Suffolk Downs, pursuant to an agreement with Mohegan, leases a portion of the Suffolk Downs property in Revere to Mohegan for the development and operation of the gaming establishment and that the track, which sits on a parcel of land located both in East Boston and Revere, is an amenity to the gaming establishment. Moreover, the City contended, the agreement between Mohegan and Suffolk Downs provides that Suffolk Downs will receive rent in the form of basic rent and additional rent based upon gaming revenues generated at the gaming establishment. The City argues that those provisions make Mohegan and Suffolk Downs "joint venturers" in the

[5] G.L. c.23K, §10(a) states in pertinent part: "a gaming licensee shall make a capital investment of not less than $500,000,000 into the gaming establishment which shall include, but not be limited to, a gaming area, <u>at least 1 hotel</u> and other amenities as proposed in the application for a category 1 license." (Emphasis added).

[6] The Commission promulgated regulations further outlining the process for the determination of a surrounding community. <u>See</u> 205 CMR 125.00.

gaming establishment and that the gaming establishment includes the track as a nongaming structure related to the gaming area.

Mohegan's presentation to the Commission defined the gaming establishment as including the gaming area, two hotels, parking areas, restaurants, nightclubs, bars, spas, retail area, convention/meeting space and internal roadways. Mohegan stated that, unlike with the original proposal forwarded by Suffolk Downs, the gaming establishment in Mohegans's proposal and the track are owned by separate entities; that Mohegan has no control over the track and Suffolk Downs does not have operational control over the proposed gaming establishment; Suffolk Downs is a landlord to Mohegan and receives rent; and the receipt of rent based upon revenues generated is a common feature of a commercial lease. Mohegan acknowledged that the agreement between Mohegan and Suffolk Downs did contain a provision that allowed Suffolk Downs to require, at Suffolk Down's option and at some unnamed future date, to take over the operation of the track. Mohegan and Suffolk Downs stated that by mutual agreement of the parties that provision in the agreement has been deleted. Both Mohegan and Suffolk Downs asserted that even if that provision had remained in place, the gaming establishment and the track would remain owned by separate legal entities and that the provision did not provide for a sale of the track to Mohegan.[7]

Suffolk Down's presentation to the Commission stressed that no property on which the track was located, whether in Revere or East Boston, was part of the real property leased to Mohegan. In addition, there was no marketing agreement between Mohegan and Suffolk Downs to jointly market the track and the gaming establishment. The Commission asked Suffolk Downs whether the track was an amenity to the gaming establishment. Suffolk Downs responded by saying that in its view, to be an amenity, the track has to be located on the same real property as the gaming establishment and must be controlled by the gaming establishment. Neither situation existed here. The Commission further asked Suffolk Downs whether the revenues from the agreement with Mohegan, if used to support track operations, would make the track an amenity. Suffolk Downs responded that profits received do not create an amenity.

The City of Revere argued that the proposed gaming establishment is located entirely in Revere, that Revere will provide all emergency police and fire services, and that all water and sewer connections would be provided by Revere.

No Eastie Casino's supported the City's position. No Eastie Casino stated that Mohegan presented the track as an integral part of its application for a gaming license. It also urged that the impacts from the proposed gaming establishment cannot be separated from East Boston and that this proposal is no different in that respect from the earlier proposal submitted by Suffolk Downs.

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[7] The provision at issue also included language making any such exercise of the option subject to Commission approval and if allowed by law. Where the provision has been removed from the agreement the Commission declines to comment on whether an exercise of the option would have been legal.

b. Wynn briefs and presentations

The Commission received briefs and oral presentations from Wynn, and No Eastie Casino, and an oral presentation from the City on the definition of the gaming establishment for which Wynn seeks approval under its RFA-2 application. All of the written material received and reviewed by the Commission is available for public review on the Commission's website, www.massgaming.com.

The City first argued that the option agreement for the real property on which Wynn proposed to locate the gaming establishment is not valid and without a valid agreement for the land there can be no gaming establishment. The agreement's invalidity, in the City's view, stems from issues regarding FBT Everett Realty LLC, the land's owner, which the Commission explored extensively at hearings it held on December 13 and December 16, 2014. The Commission understands the City's argument to be that if FBT Everett Realty LLC is unsuitable the agreement between FBT Everett Realty LLC therefore violates G.L. c. 23K and that, as a result, there can be no gaming establishment. However, FBT Everett Realty LLC is not a "qualifier" as defined in G.L. c. 23K, §14 or 205 CMR 116.00 and the City's argument is not supported by the Commission's investigation, prior findings or conditions imposed on FBT Everett Realty LLC at the conclusion of the commission's December hearings.

The City further argued to the Commission that if there is in fact a valid agreement for the purchase of the real property, there is still an issue with access to the real property. While Wynn proposed alternate access through a new access point in Everett, the current access is through Horizon Way, which begins in part in the City. Their argument hinged on *Beale v Planning Board of Rockland*, 423 Mass. 690 (1996). The City's assertion based on *Beale* is essentially that if Horizon Way will be used to access a casino and casinos are not permitted in that part of the City then the road cannot be used for casino use so there is no access to the proposed gaming establishment.

The City further argued that Wynn's RFA-2 application listed attractions in the City, such as a marketing agreement with the TD Garden and the Boston Symphony Orchestra, and that the proposed water shuttle from the gaming establishment will take patrons of the gaming establishment to locations in the City. Based upon these activities, it suggested, the gaming establishment includes amenities located in the City.

No Eastie Casino argued in support of the City's position making specific note of the access to the proposed gaming establishment, and the agreements with attractions in the City. No Eastie Casino further supported the City's interpretation of the *Beale* case and its relevance to the access issue.

Wynn's presentation to the Commission defined the gaming establishment as the gaming area, two hotels, parking areas, restaurants, nightclubs, bars, spas, retail area, and

convention/meeting space. Wynn presented the site plan of the proposed gaming establishment and described in detail each aspect and how it was part of the gaming establishment.

Wynn disagreed with the City's interpretation of the *Beale* case, stating that the *Beale* case is a zoning use case and is not relevant to the definition of the gaming establishment under G.L. c. 23K. While Wynn's preferred access is not through Horizon Way, Wynn stated that Horizon Way is an existing public road that runs from Alford Street and is bisected by the Everett border. Wynn cannot own or change Horizon Way. Horizon Way, Wynn urged, provides "ready access" to the proposed gaming establishment. As a result, to the extent that Horizon Way is in the City, the City's "transportation infrastructure provides ready access to [a] . . . proposed gaming establishment," which makes the City a surrounding community within the definition contained in G.L. c. 23K, § 2.

In sum, Wynn stated that physical location defines the host community; access and impacts define the surrounding community. Based upon the definitions in M.G.L. c. 23K, Wynn stated that its proposed gaming establishment is located in Everett.

c. <u>Analysis and determinations</u>

The Commission considered all of the briefs, reply briefs, and oral presentations made at the May 8, 2014 hearing and the information provided in each of Mohegan and Wynn's RFA-2 applications. The Commission considered those materials in light of G.L. c.23K and specifically the definitions of "gaming area," "gaming establishment," "host community," and "surrounding community" found in G.L. c.23K, §2. When viewed as a whole, the law sets out essentially a four part analysis to determine what features proposed by the applicant will be part of a gaming establishment. That is, whether the feature: (1) is a non-gaming structure, (2) is related to the gaming area, (3) is under common ownership and control of the gaming applicant, and (4) the Commission has a regulatory interest in including it as part of the gaming establishment. Part 4 only comes into play though, where the first three parts are satisfied. The control element of part 3 is implicit in the statute's licensing and registration requirement, <u>see</u> G.L. c. 23K, §§30 through 32, the requirement for the licensee to own or control all land on which the gaming establishment is located, G.L. c. 23K, §15(3), and the statute's general structure which places control of the licensee at the heart of the Commission's regulatory authority.

As a result, and for the following reasons, the Commission has determined that the gaming establishment for the Mohegan application is as identified in Exhibit B, and the gaming establishment for the Wynn application is as identified in Exhibit C.

<u>Mohegan's gaming establishment</u>

In the case of Mohegan, the Commission concludes that the gaming area and the nongaming structures related to the gaming area all are located in Revere.

The Commission considered the arguments regarding the track as an amenity to the gaming establishment and determined that it does not satisfy all elements of the 4 part test set forth above and as such, is not an amenity to be included in the gaming establishment. Given the lack of proximity between the entrance to the track from the entrance to the gaming area, no infrastructure connecting the structures, lack of common ownership or control of track operations by Mohegan now, and in the future based upon the parties mutual agreement to delete the provision in the agreement between them that would have allowed Suffolk Downs to require Mohegan to manage the track and lack of any cross marketing plans or agreements between the two entities we find that the track is not related to the gaming area.

On the record presently before the Commission, the Commission concludes that the gaming area, hotels, meeting rooms, spas, ball room, retail areas, restaurants/food and beverage/lounge areas, nightclub, back of the house, underground parking areas, physical plant/facilities maintenance, and all public areas related to those spaces meet the 4 part test and are accordingly part of the gaming establishment. They are all non-gaming structures that are related to the gaming area. They are related in that they are included to support the gaming area by making the entire facility a more attractive destination. They are all owned by Mohegan. In its discretion, the Commission considers them to be amenities to the gaming area because it has an interest in, amongst other things, ensuring that all employees working in those areas are licensed or registered in accordance with 205 CMR 134.00 and having knowledge of the flow of money through these areas. Such control helps ensure the integrity of gaming in the Commonwealth through strict oversight.

For similar reasons the Commission, again in the exercise of its discretion, does not consider the internal roadways on the site, entrance to the property, and exterior parking areas to be part of the gaming establishment. Although they are owned by Mohegan, the Commission does not have any regulatory interest in overseeing those areas. They are all subject to governmental oversight in the ordinary course and there is no additional benefit to including those areas within the gaming establishment. Further, by inclusion of hotels and restaurants as an example of an amenity in the definition of gaming establishment in G.L. c.23K, §2, the Legislature suggested that the term structure be applied in its traditional sense. Here, where those areas would not be structures in the traditional sense, they would not meet part 1 of the analysis and as such cannot be included as part of the gaming establishment.[8]

<u>Wynn's gaming establishment</u>

In the case of Wynn, the Commission found that the concerns raised by the City about FBT Everett Realty LLC are a separate matter and not part of the determination of the premises of the gaming establishment for a number of reasons. First, the members of FBT are not "parties

[8] It is possible that some parts of the internal roadway could be made part of the gaming establishment for limited purposes in the future. <u>See</u> G.L. c.23K, §6(c).

in interest to the gaming license, including affiliates and close associates and the financial resources of the applicant." G.L. c.23K, §12(a)(6). Further, they are not individuals who possess "a financial interest in a gaming establishment, or with a financial interest in the business of the gaming licensee or applicant for a gaming license or who is a close associate of a gaming licensee or an applicant for a gaming license." G.L. c.23K, §14(a). Nor do they fit into a category of individuals whom the Commission has specifically identified as having to be qualified as part of the RFA-1 suitability determination or have the ability to exercise control or provide direction to Wynn. See 205 CMR 116.02. Essentially, once the transfer of the land is complete, FBT Everett Realty LLC will have no further involvement with the gaming licensee. Accordingly, where they are not qualifiers to the Wynn proposal, the Commission has and will continue to deal with them separately.

The primary issue raised by the City was essentially that because Horizon Way is partly in the City, the City is a host community. However, Horizon Way does not satisfy the 4 part analysis and it is not part of the gaming establishment. For the same reason, internal roadways on the site, the harbor walk, and exterior parking areas are not part of the gaming establishment. None of these elements are structures in the traditional sense as discussed above. Accordingly, they do not satisfy part 1 of the analysis and cannot be included as part of the gaming establishment. Further, under part 4, the Commission does not have any regulatory interest in overseeing those areas. Similarly, though it may be considered a structure, the Commission does not have any regulatory interest in overseeing the proposed dock for the water shuttle. They are all subject to governmental oversight in the ordinary course and there is no additional benefit to including those areas within the gaming establishment.[9] As to the City's argument about the applicability of the *Beale* case, we do not find *Beale* to be relevant to the determination in this matter. That case was a zoning case and is not applicable here.

On the record presently before the Commission, and as Wynn has agreed, the Commission concludes that the gaming area, hotels, meeting and convention spaces, spas, ball room, retail areas, restaurants/food and beverage/lounge areas, nightclub, back of the house, underground parking areas, physical plant/facilities maintenance, and all public areas related to those spaces meet the 4 part test and are accordingly part of the gaming establishment. They are all non-gaming structures that are related to the gaming area. They are related in that they are included, at least in part, for purposes of enhancing the gaming area by making the entire facility a more attractive destination. They are all owned by Wynn. In its discretion, the Commission considers them to be amenities to the gaming area because it has an interest in, amongst other things, ensuring that all employees working in those areas are licensed or registered in accordance with 205 CMR 134.00 and having knowledge of the flow of money through these areas. Such control helps ensure the integrity of gaming in the Commonwealth through strict oversight.

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[9] It is possible that some parts of the internal roadway could be made part of the gaming establishment for limited purposes in the future. See G.L. c.23K, §6(c).

The Commission further considered the arguments raised by the City and by No Eastie Casino regarding cross marketing agreements with entities, such as the TD Garden and Boston Symphony Orchestra, located in the City and the fact that the City may be an attraction for patrons of the gaming establishment. Cross marketing agreements and encouraging gaming establishment patrons to visit other regional attractions is in fact a goal set forth in G.L. c. 23K. See e.g. G.L. c.23K, §§1(6), 9(a)(13), 9(a)(18), and 18(5). Each applicant for a gaming license is evaluated in part on how the applicant proposes to support other local and regional business and increase tourism. The fact that Wynn has cross marketing agreements and intends to provide water shuttle transportation to parts of the City's waterfront are simply actions by Wynn to comply with the requirements of G.L. c. 23K. Further, none of these attractions is related to the gaming area, Wynn has no ownership or control over their operations, and the Commission does not have an interest in regulatory oversight of these entities.

4. Conclusion

Based upon the briefs and reply briefs submitted and public submissions received by the Commission, the presentations made to the Commission at the May 8, 2014 public meeting, and the information provided to the Commission in the RFA-2 application submitted by Mohegan the Commission determines that the premises of the gaming establishment for which Mohegan Sun Massachusetts, LLC seeks approval in its RFA-2 application consists of the gaming area, hotels, meeting rooms, spas, ball room, retail areas, restaurants/food and beverage/lounge areas, nightclub, back of the house, underground parking areas, physical plant/facilities maintenance, and all public areas related to those spaces, and that based upon the definition of gaming establishment found in G.L. c. 23K, §2, the premises of the gaming establishment are located in Revere. The gaming establishment is identified in the attached Exhibit B as the area located within the black marker boundary line.

Based upon the briefs and reply briefs submitted and public submissions received by the Commission, the presentations made to the Commission at the May 8, 2014 public meeting, and the information provided to the Commission in the RFA-2 application submitted by Wynn MA, LLC the Commission determines that the premises of the gaming establishment for which Wynn MA, LLC seeks approval in its RFA-2 application consists of the gaming area, hotels, meeting and convention spaces, spas, ball room, retail areas, restaurants/food and beverage/lounge areas, nightclub, back of the house, underground parking areas, physical plant/facilities maintenance, and all public areas related to those spaces, and that based upon the definition of gaming establishment found in G.L. c. 23K, §2, the premises of the gaming establishment are located in Everett. The gaming establishment is identified in the attached Exhibit C as the area located within the black marker boundary line.

A plain review of the definitions of the terms 'host community' and 'surrounding communities' reveals a clear legislative intent that a host community be determined based solely upon matters of geography, and that surrounding communities be determined based upon

impacts. Our findings relative to location of the respective gaming establishments for the Mohegan and Wynn applications are consistent with that intent. The Mohegan gaming establishment is located solely in Revere. Accordingly, by definition, the City of Boston is not a host community to that project. The Wynn gaming establishment is located solely in Everett. Accordingly, by definition, the City of Boston is not a host community to that project. Based upon the proximity and impacts from the respective projects, however, the City of Boston is clearly a surrounding community to both.

SO ORDERED.

MASSACHUSETTS GAMING COMMISSION

James F. McHugh, Commissioner

Gayle Cameron, Commissioner

Bruce Stebbins, Commissioner

Enrique Zuniga, Commissioner

DATED: May 15, 2014

MASSGAMING

EXHIBIT A

UPDATED

NOTICE OF MEETING and AGENDA
May 1, 2014

Pursuant to the Massachusetts Open Meeting Law, G.L. c. 30A, §§ 18-25, notice is hereby given of a meeting of the Massachusetts Gaming Commission. The meeting will take place:

Thursday, May 1, 2014
10:30 a.m. – 5:00 p.m.
Boston Convention and Exhibition Center
415 Summer Street, Room 102A
Boston, MA

PUBLIC MEETING - #118

1. Call to order

2. Determine the premises of the gaming establishment for which Mohegan Sun Massachusetts, LLC seeks approval in its RFA-2 application.

3. Determine the premises of the gaming establishment for which Wynn MA, LLC seeks approval in its RFA-2 application.

   - In anticipation of the May 1, 2014 discussion by the Commission, public comment is hereby requested essentially in the form of legal briefs or memoranda relative to agenda items 2 and 3.
   - The briefs should be prepared so as to assist the Commission in its discussion of agenda items 2 and 3 referenced above. Any individual or group may submit a brief relative to one or both of the aforementioned agenda items. The briefs should state the reasons for the position(s) taken, identify supporting legal authorities, and include any sworn affidavits, authenticated documents, and other relevant evidence not otherwise included in an RFA-2 application. Briefs shall be limited to 15 pages exclusive of attachments.
   - Initial briefs are due by **April 17, 2014 at 5 p.m.** All briefs, including any affidavits and other documents submitted with the briefs, will be posted on www.massgaming.com the day after the due date.
   - Any individual or group may submit a reply brief by **April 24, 2014 at 5 p.m.** An individual or group need not have submitted an initial brief to submit a reply brief. A reply brief, however, may only address specific issues that were addressed in a brief submitted by another individual or group. Reply briefs shall be limited to 10 pages exclusive of attachments. All reply briefs, including any affidavits and other documents submitted with the reply briefs, will be posted on www.massgaming.com the day after the due date.
   - A brief or reply brief may be submitted by way of mail or hand delivery to the Commission's office or via email at catherine.blue@state.ma.us and todd.grossman@state.ma.us. No briefs or reply briefs will be accepted or considered if received by the Commission after the submission deadline.
   - At any time before conclusion of the May 1, 2014 meeting the Commission may request the City of Boston or the applicants or any other individual or group to provide the Commission with documents or other information the Commission believes would be helpful in determining the location of the proposed gaming establishments.

* * * * *

- The City of Boston and the Region A applicants for a gaming license will be invited to offer an oral presentation to the Commission at the public meeting on May 1, 2014 if they have submitted a brief or reply brief. The Commission may invite any other individual or group that has filed a brief or reply brief to make an oral presentation at the public meeting. No person or group will be permitted to address the Commission relative to agenda items 2 and 3 unless they have submitted a brief. Oral presentations should be confined to the subject areas contained in the brief and/or reply brief submitted by the individual or group.
- Speakers representing a municipality or applicant will be allotted 30 minutes for oral presentation. All other speakers will be allotted 15 minutes. The Commission may allow a speaker more time if helpful to clarify an issue. A group may split its allotted speaking time amongst multiple speakers.
- In reviewing the issues before it, the Commission may ask any question(s) of any individual and review and consider any document or other source of information. For purposes of the record of the meeting, the Commission will take notice of the contents of the RFA-2 applications submitted by Mohegan Sun Massachusetts, LLC and Wynn MA, LLC.
- After discussion by the Commission, the Commission will announce its determination as to whether the City of Boston is a host community for each of the two proposals. After the conclusion of the hearing, the Commission will issue written findings that describe the respective gaming establishments for the projects the applicants have proposed.

4. Approval of Minutes
    a. March 6, 2014
    b. April 17, 2014

5. Administration – Rick Day, Executive Director
    a. General Update
    b. High Performance Project Scope Consideration – Commissioner Cameron
    c. Potential Changes to 23K and Legislation – Chairman Crosby
    d. Request for Comment on Design Excellence

6. Legal Report – Todd Grossman, Deputy General Counsel
    a. New Qualifiers Regulations – Rick Day, Executive Director

7. Information Technology Division – John Glennon, CIO
    a. Slots Standards and Approval Process Regulations

8. Other business – reserved for matters the Chair did not reasonably anticipate at the time of posting.

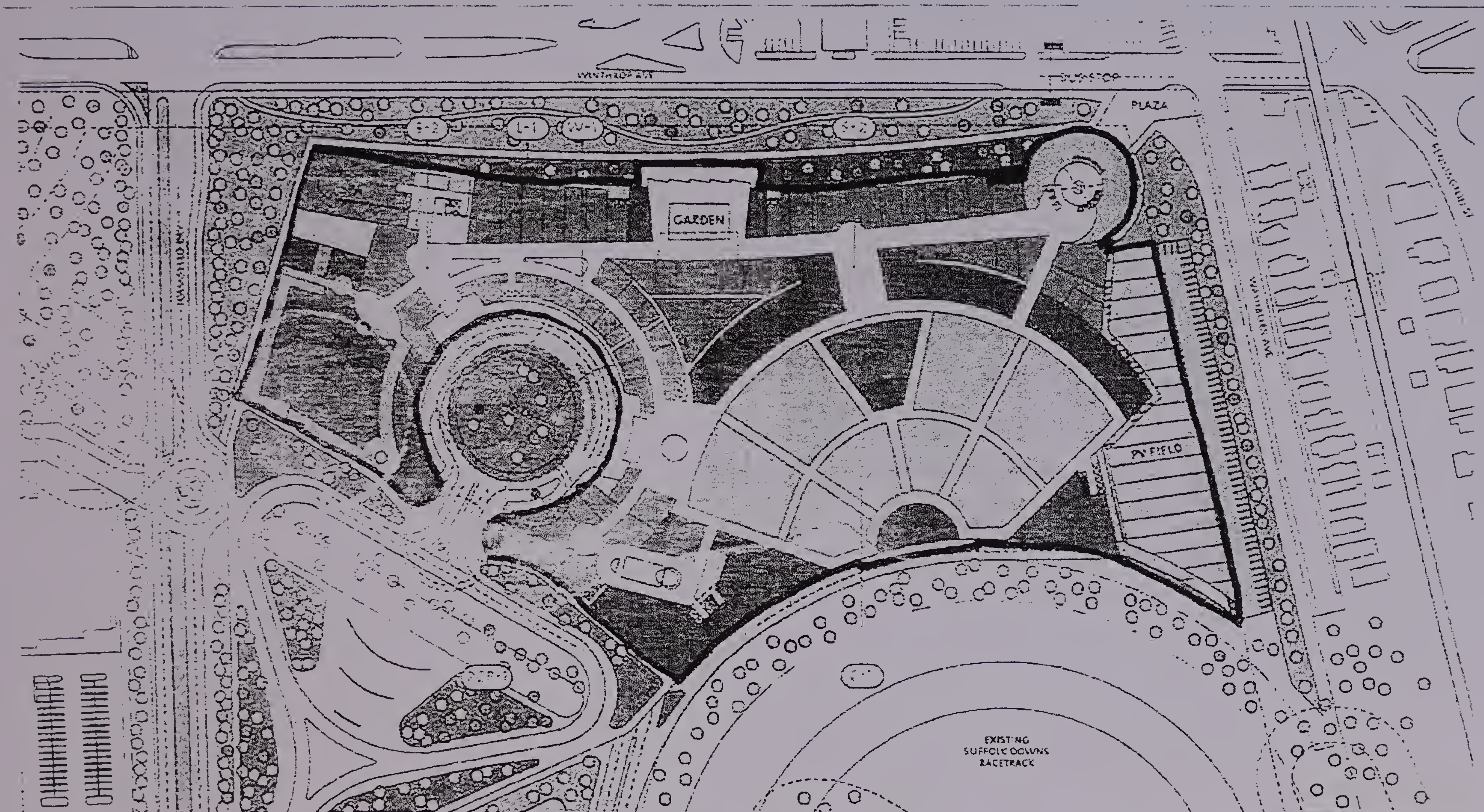
Any matters on the agenda for May 1, 2104 that the Commission does not address at the May 1st meeting will be addressed at the May 2, 2014 meeting scheduled for 10:30 a.m. at the Boston Convention and Exhibition Center, 415 Summer Street, Room 102A, Boston, MA.

I certify that on this date, this Notice was posted as "Gaming Commission Meeting" at www.massgaming.com and emailed to: regs@sec.state.ma.us, melissa.andrade@state.ma.us.

4/28/14
(date)

Stephen P. Crosby, Chairman

Date Posted to Website: April 28, 2014 at 10:30 a.m.



MAIN FLOOR PLAN ENLARGED

4.5 SCHEMATIC DESIGN

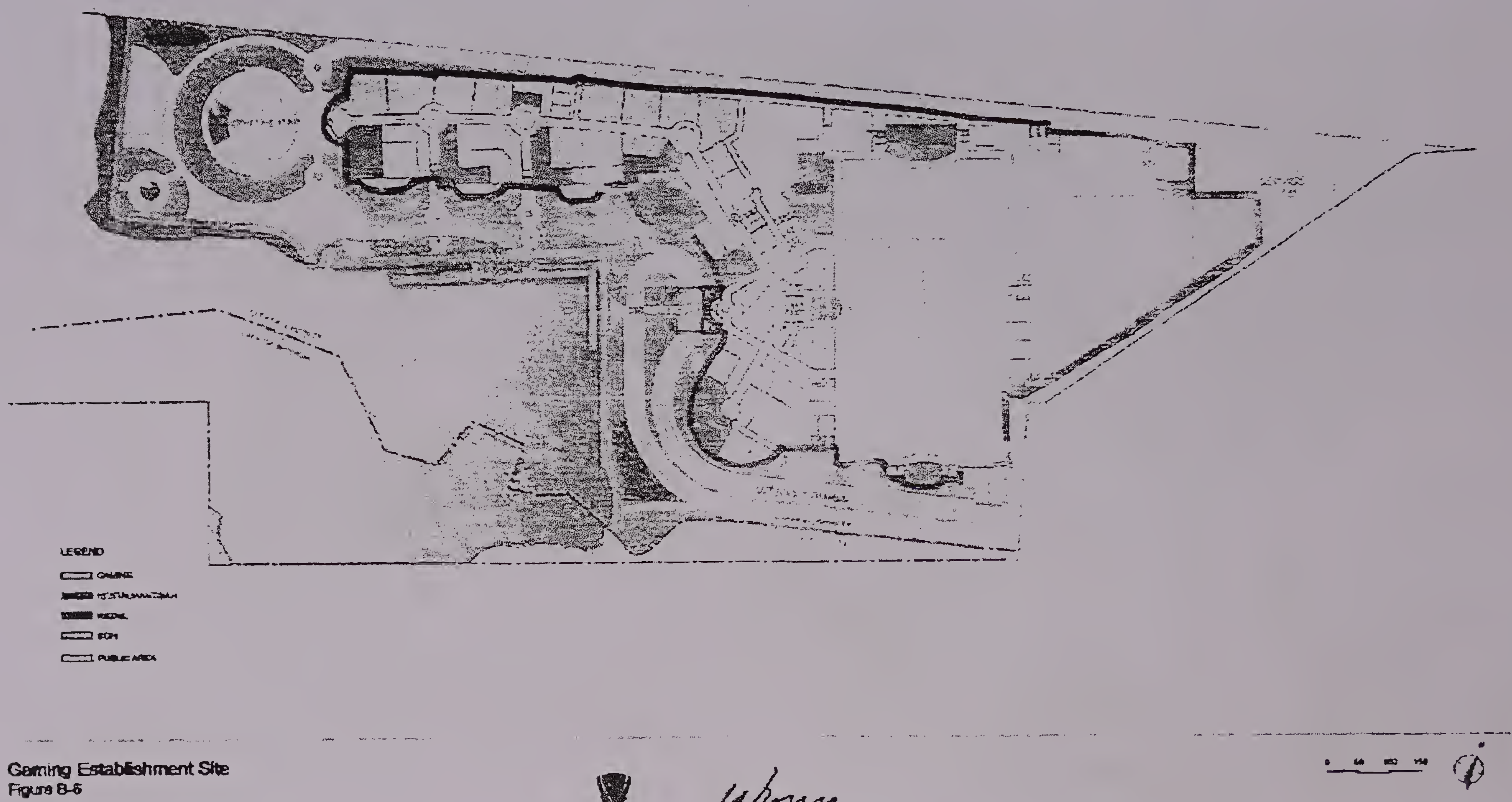
KPF

1/84"=1'-0"

EXHIBIT B

MOHEGAN SUN MASSACHUSETTS, LLC

= OUTLINE OF GAMING ESTABLISHMENT



Gaming Establishment Site
Figure B-6

EVERETT

WYNN MA, LLC

EXHIBIT C

= OUTLINE OF GAMING ESTABLISHMENT

EXHIBIT 2

SUMMARY OF CONDITIONS
WYNN MA, LLC

	Section 1
Definitions	
	As used in this License, terms shall have the meaning defined in G.L. c. 23K and 205 CMR 101.00 *et. seq.*, unless the context clearly requires otherwise. In addition, the following terms shall have the following meanings:
Effective Date	The Effective Date of the License shall be three (3) business days after the rejection of the repeal petition in the November 4, 2014 general election.
EOEEA	Executive Office of Energy and Environmental Affairs.
FEIR	The Final Environmental Impact Report dated June 30, 2014, for the Project.
LEED	Leadership in Energy and Environmental Design, which is a rating system for the design, construction, operation, and maintenance of green buildings developed by the U.S. Green Building Council.
License	The Category 1 gaming license issued by the Commission to Wynn for operation of the Gaming Establishment.
MBE	Minority Business Enterprise.
MEPA	Massachusetts Environmental Policy Act, G.L. c. 30, §§ 61 through 62I, and the regulations promulgated by EOEEA pursuant thereto, 301 CMR 11.00 *et. seq.*
Opening Date	The Date on which the Gaming Establishment commences operations and opens to the general public as approved by the Commission in accordance with G.L. c. 23K and 205 CMR 101 *et. seq.*
Project	The construction and operation of the Gaming Establishment that is the subject of the License described in Wynn's RFA-2 application and as approved by the Commission as part of the Category 1 gaming license.
Secretary's Certificate	The MEPA Certificate issued by the Secretary of EOEEA on the FEIR and/or on the SFEIR (as applicable) for the Project.
SFEIR	The Supplemental Final Environmental Impact Report for the Project.
Term	The term of the license commences upon the Commission approval of the commencement of operation of the Gaming Establishment and continues for a period of 15 years thereafter.
VBE	Veteran Business Enterprise.
WBE	Women Business Enterprise.
Wynn	Wynn MA, LLC, a Nevada limited liability company with principal address and offices located at 3131 Las Vegas Boulevard South, Las Vegas, Nevada 89109.

		Section 2
	General Conditions	
1.	Compliance with G.L. c. 23K and 205 CMR	Compliance with all of the requirements of G.L. c. 23K, including but not limited to all conditions set forth in G.L. c.23K, §21(a) and (b), as now in effect and as hereafter amended and 205 CMR 101 et seq., as now in effect and as hereafter promulgated or amended.
2.	Compliance with MEPA	Compliance with all of the terms and conditions required by MEPA as provided in the Secretary's certificate and in any FEIR or SFEIR required by the EOEEA
3.	Compliance with debt to equity ratio requirements	Compliance with any debt-to-equity ratio requirements established by the Commission's regulations or directives.
4.	Payment of the License Fee	Payment of the License fee as established in G.L c. 23K, § 10(d) and 205 CMR 121.01(1) within three (3) business days of the Effective Date.
5.	Payment of the Assessment Fee	Payment of assessments made pursuant 205 CMR 121.00 within three (3) business days of the Effective Date. Such assessments shall be offset by any installment payment made by Wynn under 205 CMR 121.02(1).
6.	Payment of the Installment and Slot Assessment Fee	Payment within three (3) business days of the Commission's vote to enter into the Agreement to Award the License to Wynn of an installment fee pursuant to 205 CMR 121.02(1) in the amount of $6,330,513. This payment shall be considered an installment payment and credited to the Slot Assessment in the amount of $1,550,843 and six (6) months of the Commission's Annual Assessment in the amount of $4,779,670 as set forth in G.L. c. 23K, §56(a) and (c); 205 CMR 121.01(3) (a) and (3) (b); 205 CMR 121.02(2) and (3) and subject to the revision pursuant to 205 CMR 121.00.
7.	Bond	Within 30 days after the Effective Date, Wynn shall: (a) make a cash deposit representing 10% of the total investment proposed in the RFA-2 application into an interest bearing escrow account held by the Commission in accordance with G.L. c. 23K, §10(a); or (b) secure a deposit bond, in a form and from an institution acceptable to the Commission representing 10% of the proposed capital investment. Such cash deposit or bond shall be forfeited to the Commonwealth of Massachusetts if Wynn is unable to complete the

		Gaming Establishment, as determined by the Commission.
8.	**Compliance with G.L. c.23K, §15(3)**	Compliance with the requirements of G.L. c. 23K, §15(3) regarding land acquisition within 60 days of the Effective Date.
9.	**Compliance with Agreements**	Wynn shall have an affirmative obligation to abide by and comply with the terms and conditions of the following: 1. the host community agreement; 2. surrounding community agreements; 3. conditions imposed by the Commission in lieu of a surrounding community agreement with the City of Boston, 4. impacted live entertainment agreements; 5. lottery agreements; 6. any agreements related to the Licensee's RFA-2 application signed with local partners as of the Effective Date; 7. the memorandum of understanding between Wynn and the Massachusetts Community College Casino Career Institute attached to the RFA-2 application as exhibit 3-03-02; 8. affirmative marketing programs for those businesses identified in G.L. c. 23K, §21(a)(21)(i),(ii), and (iii) for design and construction of the Gaming Establishment; 9. affirmative action programs identified under G.L. c.23K, §21(a)(22); 10. all federal, state and applicable and lawful local permits and approvals required to construct and operate the Gaming Establishment; and 11. all executed Signature Forms contained in section B of the RFA-2 application.
10.	**Affirmative Marketing Program – Design and Construction**	The provision of a plan including public events and outreach within thirty (30) days of the Commission's request after the Effective Date for the Commission's review and approval creating an affirmative marketing program for those businesses identified in c.23K, §21(a)(21)(i) and (ii) (MBEs, VBEs and WBEs) for design and construction. The plan will include a robust public outreach component to those businesses identified in c.23K, §21(a)(21)(i) and (ii) for design and construction.
11.	**Affirmative Marketing Program – Goods and**	The provision of a plan including public events and outreach within ninety (90) days of the Commission's request after the Effective Date for the Commission's

	Services	review and approval creating an affirmative marketing program for those businesses identified in G.L. c.23K, §21(a)(21)(iii) for provision of goods and services procured by the Gaming Establishment. The plan will include a robust public outreach component to those businesses identified in G.L. c.23K, §21(a)(21)(iii) for provision of goods and services procured by the Gaming Establishment.
12.	Affirmative Action Program	The provision of a plan including public events and outreach within thirty (30) days of the Commission's request after the Effective Date of the License for the Commission's review and approval creating an affirmative action program of equal opportunity to those residents identified in G.L. c.23K, §21(a)(22) on construction jobs. The plan will include a robust public outreach component to those residents identified in G.L. c.23K, §21(a)(22) (minorities, women and veterans).
13.	Compliance with Construction Plans	Compliance with the construction plans, specifications, and timelines as approved by the Commission in accordance with G.L. c. 23K and 205 CMR.
14.	Creation of a Plan to Identify and Market Employment Opportunities to Unemployed Residents	The provision of a plan within ninety (90) days of the Commission's request after the Effective Date to work with the Massachusetts Department of Labor and Workforce Development and related state and local agencies, including consultation with the Massachusetts Department of Labor and Workforce Development, to create a plan for approval by the Commission to identify and market employment opportunities to unemployed residents of Massachusetts. The plan will include a robust public outreach component to identify and market employment opportunities to unemployed residents of Massachusetts.
15.	Creations of a Regional Tourism Marketing Plan	The creation of a regional tourism, marketing, and hospitality plan in consultation with the regional tourism council and the Massachusetts Office of Travel and Tourism, and subject to approval by the Commission. Such plan shall include, but is not limited to, making space available in the Gaming Establishment for state and regional tourism information, links on Wynn's website to the regional tourism council website, a joint marketing program with the regional tourism council and the Massachusetts Office of Travel and Tourism, staff training in regards to the plan and sharing of visitor data with the

		regional tourism council and the Massachusetts Office of Travel and Tourism. Such plan shall be provided to the Commission for its approval at least ninety (90) days prior to the anticipated Opening Date.
16.	**Creation of a Plan to Identify Local Vendors**	In conjunction with the Massachusetts Gaming Commission Vendor Advisory Team and any local grant awardee, the creation of a plan within ninety (90) days of the Commission's request after the Effective Date for the Commission's review and approval to assess Wynn requirements and to identify potential local vendors.
17.	**Institution of Credit and Collection Practices**	Institution of credit and collection practices that comply with G.L. c. 23K and 205 CMR.
18.	**Compliance with Commission Free Play Standards**	Compliance with any free play standards set by the Commission
19.	**Litigation Update to the Commission**	Within 30 days of the Effective Date and thereafter on an ongoing basis, Wynn shall file with the Commission and timely update a list regarding the status of all litigation to which Wynn is a party. For the purposes of this condition, litigation is defined as any matter in which (a) the damages may reasonably be expected to exceed $100,000 and which is not fully and completely covered under an insurance policy with a licensed insurance carrier or (b) the legal or equitable relief requested seeks to revoke or suspend Wynn's license or otherwise may affect Wynn's ability to apply for or maintain a license for a casino or gaming establishment in the Commonwealth or any other jurisdiction. For purposes of this section Wynn shall include Wynn MA, LLC and Wynn Resorts, Limited.
20.	**Notification of Defaults**	Wynn shall promptly inform the Commission of any declared default or any material failure to meet any payment of interest or principal when due under any of its existing or future debt.
21.	**Notification of Refinancing of Debt**	Wynn shall promptly notify the Commission if it intends to enter into a transaction to refinance its existing debt or incur any additional capital debt obligations of $50,000,000 or more, whether in a single transaction or cumulative transactions during any consecutive 12-month period
22.	**Submission of Audited**	Within fourteen (14) days of their availability and throughout the Term of the License, Wynn shall submit to

	Financial Statements	the Commission annual audited financial statements, if available; otherwise, it shall file consolidated audited financial statements with the Commission in the manner provided by 205 CMR.
23.	**Compliance with Bank Secrecy Act of 1970**	Wynn shall submit at least 90 days prior to the anticipated Opening Date and adhere to a Plan for compliance with the United States Currency and Foreign Transactions Reporting Act ("The Bank Secrecy Act of 1970").
24.	**LEED Gold Certification**	Wynn shall commit to being LEED Gold or higher certifiable in the manner indicated in the FEIR and the most recent LEED Gold score sheet submitted by Wynn as part of its RFA-2 application, whichever is more recent.
25.	**Compliance with Wage Scales Provided in RFA- 2**	Wynn shall adhere as reasonably as practicable to the average wage scales provided in its RFA-2 application.
26.	**Application for Alcoholic Beverage License**	Wynn shall apply for an alcoholic beverage license in accordance with G.L. c. 23K and 205 CMR.
27.	**Compliance with All Permitting Requirements**	Wynn shall take all reasonable steps necessary to obtain all required permits for commencement of the Project, and to continue related design work, and to put in place all necessary contracts such that Wynn will be ready to commence work on the Project as soon as practicable after the Effective Date of the License. For the purposes of this paragraph, determination of reasonableness and practicability shall be determined through agreement between Wynn and the Commission. Wynn shall report to the Commission on a monthly basis regarding its progress.
28.	**Notification of Selection of General Contractor**	Wynn shall report to the Commission upon selection of a General Contractor and meet with the Commission to review MBE, WBE and VBE commitments and to ensure that the Contractor is aware of and accepts the MBE/WBE/VBE commitments set out in the RFA-2 application.
29.	**Construction labor report**	Wynn shall provide to the Commission, on a quarterly basis, a detailed statistical report on the number, gender and race of individuals hired to perform labor as part of the construction of the gaming establishment.
30.	**Maintenance of Workplace Population in**	Wynn shall report to the Commission regarding discussions with the City of Everett to maintain workforce

	Everett	population in the City of Everett.
31.	**Provision of Reports on Macau Operations**	Wynn shall provide the Commission in a timely manner with copies of all reports on Macau operations by Wynn or any of its affiliates that are required to be filed in any U.S. jurisdiction.
32.	**Re-opener Provisions Re: the City of Boston**	At any time prior to the Opening Date, Wynn and the City of Boston may negotiate and enter into a surrounding community agreement to mitigate impacts pursuant to 205 CMR 125.00. In the event that Wynn and the City of Boston enter into a surrounding community agreement, the parties will submit the agreement to the Commission. The Commission will determine if any of the conditions of the License should be amended or modified and if the Commission so determines, the Commission has the authority to make such amendments or modifications to the License conditions.
33.	**Re-opening of Conditions by the Commission**	Nothing shall prevent the Commission from amending or modifying the License conditions upon a petition from the City of Boston, or a petition by Wynn or upon a motion by the Commission. Provided, however, any such petition filed by the City of Boston shall be limited to those conditions contained in Sections 3 or 4 of these conditions directly related to its interests.
34.	**Conditions Binding on Successors and Assigns**	All of the terms and conditions of the License shall be binding upon Wynn and its permitted successors and assigns.

		Section 3
	Conditions Required to Mitigate Impacts to the City of Boston	
1.	**Mitigation Required by MEPA**	Wynn shall complete all mitigation, including traffic mitigation, required pursuant to the MEPA process for the Project and subsequent permitting including but not limited to the measures concerning impacts identified in the Secretary's certificate, the FEIR dated June 30, 2014, the future SFEIR and the Secretary's certificate for the SFEIR and shall be responsible for all costs associated with such mitigation.
2.	**Mitigation Payments**	1. <u>Upfront Payment</u> Wynn shall pay a one-time, upfront, non-refundable payment of One Million Dollars ($1,000,000.00) which amount shall be payable within sixty (60) days following the Effective Date (as defined in the Conditions to License) to the General Fund.. 2. <u>Annual Payment</u> Following the Opening Date, Wynn shall make an annual payment of One Million Six Hundred Thousand Dollars ($1,600,000.00), which amount shall be due on or before the ninetieth (90th) day following the Opening Date and on each annual anniversary thereof. The allocation of this annual payment shall for Other Mitigation, which amount shall be deposited into the General Fund. For purposes of this section, "Other Mitigation" shall include the following: (i) staffing and other public safety initiatives related to increased pedestrian and vehicular traffic in the City of Boston related to the Wynn Resort in Everett following the Opening Date; (ii) improvements to facilities within Boston to facilitate water transportation and to fund staffing and other public safety initiatives related to increased use of water transportation in the Boston Harbor related to the Wynn Resort in Everett; (iii) support of Charlestown's non-profits, parks, after-school activities, senior programs, job training programs, cultural events and related activities that promote Charlestown's heritage, quality of life, recreational and cultural activities including, without limitation, the Charlestown Little League and Charlestown Youth Hockey programs; and (iv) any other impacts including any transportation infrastructure impacts and the SSIP, as described in Section 4.1 below, related to the Wynn Resort in Everett.

		For purposes of this section, "General Fund" shall mean an interest bearing escrow fund held by an escrow agent approved by the Commission and in a bank located in the Commonwealth of Massachusetts. Funds shall be distributed in accordance with the terms of an escrow agreement.
3.	**Escalation of Payments**	Beginning with the second annual payment, the Annual Payment shall be adjusted to reflect any increase in the cost of living based upon the CPI (as defined below), calculated as the average annual increase over the immediately prior twelve (12) month period. "CPI" shall mean the United States Department of Labor, Bureau of Labor Statistics, Consumer Price Index for all Urban Consumers, Boston-Brockton-Nashua, MA-NH-ME-CT All Items, 1982-84=100. In the event that the United States Department of Labor shall cease to promulgate the CPI, the Annual Payment shall be increased annually by one percent (1%) beginning with the later of the second annual payment or the year in which the United States Department of Labor ceases to promulgate the CPI.
4.	**Business Development**	During the construction phase of the Project and once the Project is operational, subject to Wynn's obligations to the City of Everett and other surrounding communities, Wynn shall make a good faith effort to utilize City of Boston contractors and suppliers for the Project and shall afford such opportunities to City of Boston vendors when such contractors and suppliers are properly qualified and price competitive. Such efforts shall include actively soliciting bids from City of Boston vendors through local advertisements, coordination with the City of Boston Chamber of Commerce and such other reasonable measures as the City of Boston may from time to time request. In furtherance thereof, on and after the Opening Date and throughout the Term of the License, Wynn shall use good faith efforts to purchase annually at least Fifteen Million Dollars ($15,000,000.00) of goods and services from vendors with a principal place of business in the City of Boston. Wynn shall work with the City of Boston to hold vendor fairs that provide City of Boston businesses with information concerning the process of providing goods and services to the Project. Wynn shall, on at least an annual basis, consult with the City of Boston Chamber of Commerce and such other business groups or associations as the City of Boston may reasonably request to identify opportunities in furtherance of the objectives set forth

		in this condition. Wynn shall, upon reasonable request, meet with the City of Boston to provide updates on Wynn's efforts to comply with this condition. Notwithstanding anything herein to the contrary, Wynn's obligations under this condition shall be subject to the availability of such goods and services at a level of quality that is consistent with the Project specifications and on commercially reasonable terms. Wynn shall work with and assist local businesses in the City of Boston to become "Wynn certified" in order to participate in this local purchasing program. Wynn certification represents a Wynn-specific vendor qualification program that requires vendors to be pre-qualified, which may include but not be limited to background checks and other screening methods utilized to qualify vendors. In recognition of the unique cultural, historical and entertainment attractions located in the City of Boston and throughout the region, Wynn shall develop and maintain a proprietary concierge program for the purpose of cross-marketing these attractions. Wynn shall allow the City of Boston to participate in this cross-marketing venture for the purpose of promoting its local businesses and other attractions. Prior to the Opening Date and throughout the Term of the License, Wynn shall cooperate with the City of Boston's Chamber of Commerce to include City of Boston businesses in Wynn's Concierge Program so that they may benefit from the Project.
5.	**Jobs Program**	In recognition of the above, subject to its obligations to the City of Everett and other surrounding communities, Wynn shall undertake the following measures: Wynn will work in a good faith, legal and non-discriminatory manner with the Wynn's construction manager to give preferential treatment to qualified City of Boston residents and, in particular, residents of Charlestown for contracting, subcontracting and servicing opportunities in the development and construction of the Gaming Establishment. Following the engagement of a construction manager, Wynn shall advertise and hold at least one event every six (6) months prior to the Opening Date for City of Boston residents at a venue located in Charlestown, at which it will publicize its construction needs and explain to attendees the process by which they may seek to be hired in connection with the construction of the Gaming Establishment.

		Prior to beginning the process of hiring employees (other than internally) for the Gaming Establishment, Wynn shall advertise and hold at least one event for City of Boston residents at a venue located in Charlestown, at which it will publicize its hiring needs and explain to attendees the process by which they may seek to be hired in connection with the Gaming Establishment and shall hold one event annually thereafter. In addition, Wynn shall work with non-profit entities to develop a job readiness training program that will be available to all residents of the City of Boston. In seeking to fill vacancies at the Gaming Establishment, Wynn will give preference to properly qualified residents of the City of Boston and, in particular, residents of Charlestown, to the extent that such a practice and its implementation is consistent with Federal, State or local law or regulation. Notwithstanding the foregoing, in recognition of Wynn's host community agreement with the City of Everett and Wynn's surrounding community agreements with the Cities of Malden and Medford, the preferences provided above shall be secondary to the preferences provided by Wynn in those agreements. The preferences provided in this condition shall be on a pooled basis with any other community that has entered or that enters into a surrounding community agreement with Wynn. Wynn shall consult in good faith with the City of Boston on an annual basis to identify prospective, qualified City of Boston employees to effectuate the terms and conditions herein.
6.	**Responsible Gaming**	Wynn shall coordinate in good faith with the City of Boston to promote responsible gaming and to develop resources available to residents of the City of Boston to address problem gambling. In furtherance thereof, Wynn and its employees and agents shall use commercially reasonable efforts to not send any marketing materials to or otherwise communicate for marketing purposes with residents of the City of Boston who have opted to participate in Wynn's self-exclusion or self-limitation programs that enable individuals to opt out of receiving marketing materials. In addition, Wynn shall provide the City of Boston and its residents with access to all compulsive gambling services associated with the Gaming Establishment and shall make available to the City of Boston its resources and employees as may be reasonably necessary to publicize those services and conduct associated educational programs. Further, to address any unanticipated adverse impacts, the City of Boston may apply to the Commission or other state agencies for grants from the

		Community Mitigation Fund and/or Public Health Trust Fund established under the Act. Wynn shall reasonably support applications made by the City of Boston to the Community Mitigation Fund and/or the Public Health Trust Fund to address the unanticipated adverse impacts.
7.	**Reopening of mitigation terms**	205 CMR 127.00 shall apply to the conditions of this License in the same manner as if the City of Boston was designated as a surrounding community.
8.	**Reimbursement Of Expenses**	In accordance with 205 CMR 114.03(2), Wynn shall reimburse Boston for actual, documented reasonable out-of-pocket expenses incurred by Boston, not to exceed $750,000.00, for legal, financial and other professional services incurred by the City of Boston, acting reasonably, as the cost of determining the impact of the proposed Gaming Establishment on the City of Boston and in particular on Charlestown.

		Section 4
	Conditions Required to Mitigate Traffic and Other Impacts Caused by the Construction and Operation of the Gaming Establishment	
1.	**Definitions**	As used in this section, the following terms shall have the following meanings: <u>Sullivan Square Infrastructure Project</u> ("SSIP"): For purposes of the license issued to Wynn, the SSIP is defined as the design, construction and maintenance of all of the improvements to Sullivan Square and adjacent roads leading into and/or connected to Sullivan Square included in any plan that is approved and permitted by the City of Boston and the Massachusetts Department of Transportation, as the long term solution to alleviate traffic congestion in Sullivan Square and the roads leading into and/or connected to Sullivan Square. The SSIP includes, but is not limited to, long term improvements to the Sullivan Square rotary; all other roadways within 500 feet of the Sullivan Square rotary (including without limitation, Main Street, Rutherford Avenue, Cambridge Street, Alford Street, Mishawum Street, Maffa Way, D Street, and Spice Street), and any Rutherford Avenue underpass beneath the Sullivan Square rotary as well as any improvements approved and permitted by the City of Boston to Rutherford Avenue between Sullivan Square and City Square. As determined by the permits issued by the City of Boston and the Massachusetts Department of Transportation, the SSIP may be designed and constructed in its entirety or in phases. <u>Sullivan Square Infrastructure Fund</u> ("SSIF"): shall mean an interest bearing escrow fund held by an escrow agent approved by the Commission and in a bank located in the Commonwealth of Massachusetts.
2.	**Sullivan Square Mitigation Plan/Traffic Reduction Incentive Payment**	In order to mitigate increased traffic arising from the Gaming Establishment, and incentivize the use of alternate transportation methods Wynn shall be required to pay to the SSIF an annual payment equal to $20,000 per additional vehicle trip ("AVT") entering and leaving the Gaming Establishment using Sullivan

		Square during the Friday afternoon peak hour in excess of the number of vehicle trips entering and leaving the Gaming Establishment using Sullivan Square during the Friday afternoon peak hour shown in the data used by the City of Boston as the basis for its issuance of any required permits necessary for the Sullivan Square mitigation plan for a period beginning on the Opening Date and ending on the 10th anniversary of the Opening Date ("Traffic Reduction Incentive Payment"). Provided, however, such payment shall not exceed \$20,000,000.00 over that 10 year period. Wynn shall provide a plan for the Commission's review and approval for a vehicle trip measurement system that will measure the number of trips entering and leaving the Gaming Establishment using Sullivan Square. No later than 30 days after the first anniversary of the Opening Date and continuing for ten (10) years thereafter, Wynn shall provide the Commission with a calculation showing the number of AVT during the Friday afternoon peak hour in excess of the Boston Permit Vehicle Trip Data and shall provide evidence of Wynn's Traffic Reduction Incentive Payment to the SSIF in an amount equal to \$20,000 times the AVT during the Friday afternoon peak hour in excess of the Boston Permit Vehicle Trip Data.
3.	**SSIF Escrow Account**	All payments required to be made by Wynn into the SSIF shall be paid into an interest bearing escrow fund held by an escrow agent approved by the Commission and in a bank located in the Commonwealth of Massachusetts. The SSIF escrow fund shall be available to reimburse the City of Boston for the costs incurred in the design, construction and maintenance of the SSIP up to the amount in the SSIF. If requested by the City of Boston and approved by the Commission, funds in the SSIF Escrow Account may be applied to costs associated with the Sullivan Square mitigation plan. If the City of Boston does not commence the SSIP within 10 years of the Opening Date, Wynn may petition the Commission for the return of any unused funds plus any interest accrued to Wynn. For purposes of this condition "Commencing the SSIP" is defined as beginning construction of/demolition for the SSIP, or any portion thereof deemed significant by the Commission, pursuant to a plan approved and permitted by the City of Boston.

4.	**SSIP Contribution**	In addition to any costs for mitigation required under MEPA and in addition to the payments to the City of Boston described in Section 3, Wynn shall be responsible for a payment equal to $25 million provided that the SSIP is designed, constructed and permitted to accommodate the traffic impacts of the Gaming Establishment. Such payment shall be made directly to the SSIF escrow account payable in equal annual installments of $2,500,000.00 beginning on the first anniversary of the Opening Date for a term of 10 years.
5.	**Transportation Demand Management**	Wynn will conduct an analysis of the automobile mode shares of employee and patron trips to and from the Gaming Establishment each year during the Term of the License on the anniversary of the Opening Date to determine if Wynn is meeting the goals in its Transportation Demand Management ("TDM") Program as determined in the SFEIR.[1] The monitoring shall be conducted by an independent organization approved by the Commission and paid for by Wynn and using the measurements described in the SSIF AVT Payment condition above. If such analysis determines that Wynn has not met the TDM goals on an annual basis for the applicable study period, Wynn shall, no later than the forty-fifth (45th) day following the anniversary of the Opening Date submit to the Commission a plan describing the method by which Wynn shall within one year meet the TDM goals and maintain compliance with the TDM (the "TDM Remediation Plan").
6.	**Community Outreach**	Wynn will engage in community outreach to the Charlestown neighborhood and consult with the neighborhood regarding the progress of the project including any transportation mitigation or changes in transportation mitigation plans. Wynn shall report on such outreach to the Commission as part of its regular reporting.
7.	**Public Involvement Plan for**	Wynn will comply with the generally applicable public

[1] In the FEIR, Wynn has set a goal of 29% of patrons to arrive to the site via non-automobile modes and 71% arriving via automobile and taxi. For employees, the goal is for 59% to arrive via non-automobile modes and the remaining 41% arriving via automobile. Nothing herein shall prevent the Commission from establishing a higher non-automobile mode share than set in the FEIR or an approved SFEIR.

	Hazardous Materials	involvement provisions of 310 CMR 40.0000. Wynn will provide all submittals required in accordance with said regulations to the Commission and the Chief Municipal Officers of the Cities of Everett, Boston and Somerville, the Boards of Health in Everett, Boston and Somerville, and such other municipal officials or community organizations as the Commission
8.	**Failure to Obtain Required Permits from the City of Boston**	Wynn will vigorously pursue all mitigation (including initiating legal proceedings, if necessary, to obtain necessary permits). Within ninety (90) days following the Effective Date, Wynn will submit to the Public Improvements Commission the application relating to Wynn's Sullivan Square mitigation.

		Section 5
	Other Conditions	
1.	Building and Site Design	The Commission strongly urges Wynn to reconsider the exterior design of the buildings and present a revised design to the Commission and, in any event, Wynn shall submit exterior material and finish selection and samples for review and approval by the Commission as part of the planned reporting to the Commission in accordance with the design and construction schedule to be approved by the Commission in accordance with 205 CMR.
2.	Economic Development	Wynn will use good faith efforts to hire no less than 75% of the Project employees from within 30 minutes of Everett as stated at the June 25, 2014 Host Community hearing in Everett.
3.	Hiring preference	Wynn will offer a hiring preference to qualified Suffolk Downs employees in the event that Suffolk Downs closes upon the award of the License to Wynn. Wynn will provide a training and recruitment plan for said employees to the Commission for approval.
4.	Medical and Dental benefits	Wynn will commit to provide its employees with competitive medical and dental benefits that are commensurate with those provided in the region.

Appendix E

AERONAUTICAL IMPACT STATEMENT

Title 14 CFR Part 77 Surfaces

Part 77 Surfaces for BOS

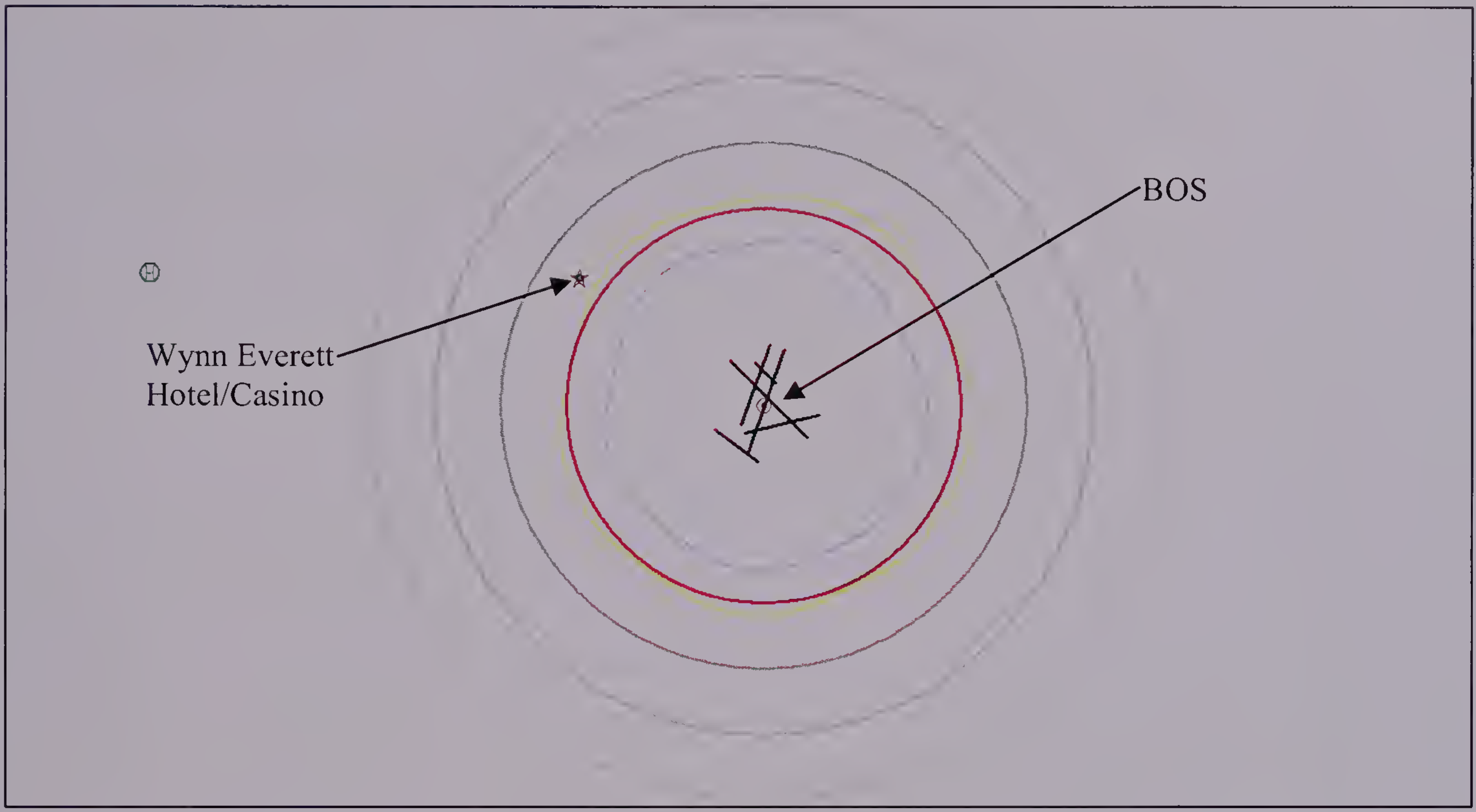


Figure 3: TERPS® image: General Edward Lawrence Logan International Airport (BOS) Part 77 Surfaces.

The General Edward Lawrence Logan International Airport (BOS) Part 77.17(a)(2) VFR Transitional Surface extends over the Wynn Everett Hotel/Casino is shown in Figure 3. The maximum allowable height within the 4 NM circle of the VFR Transitional Surface, highlighted in dark grey, ranges from 220 feet AMSL to 320 feet AMSL.

All of the proposed building points, at the studied overall height, penetrate the 77.17(a)(2) VFR Transitional Surface. Proposed structures that exceed any of the Part 77 Surfaces will receive Notices of Presumed Hazard from the FAA. Obstruction marking and/or lighting the points in accordance with the FAA Advisory Circular 70/7460-1K is typically used as mitigation for penetrations to Obstruction Standards. There are many existing structures which penetrate the VFR Transitional Surface. These obstacles can be used as mitigation as well.

General Edward Lawrence Logan International Airport (BOS)

BOS RWY 33L Departures

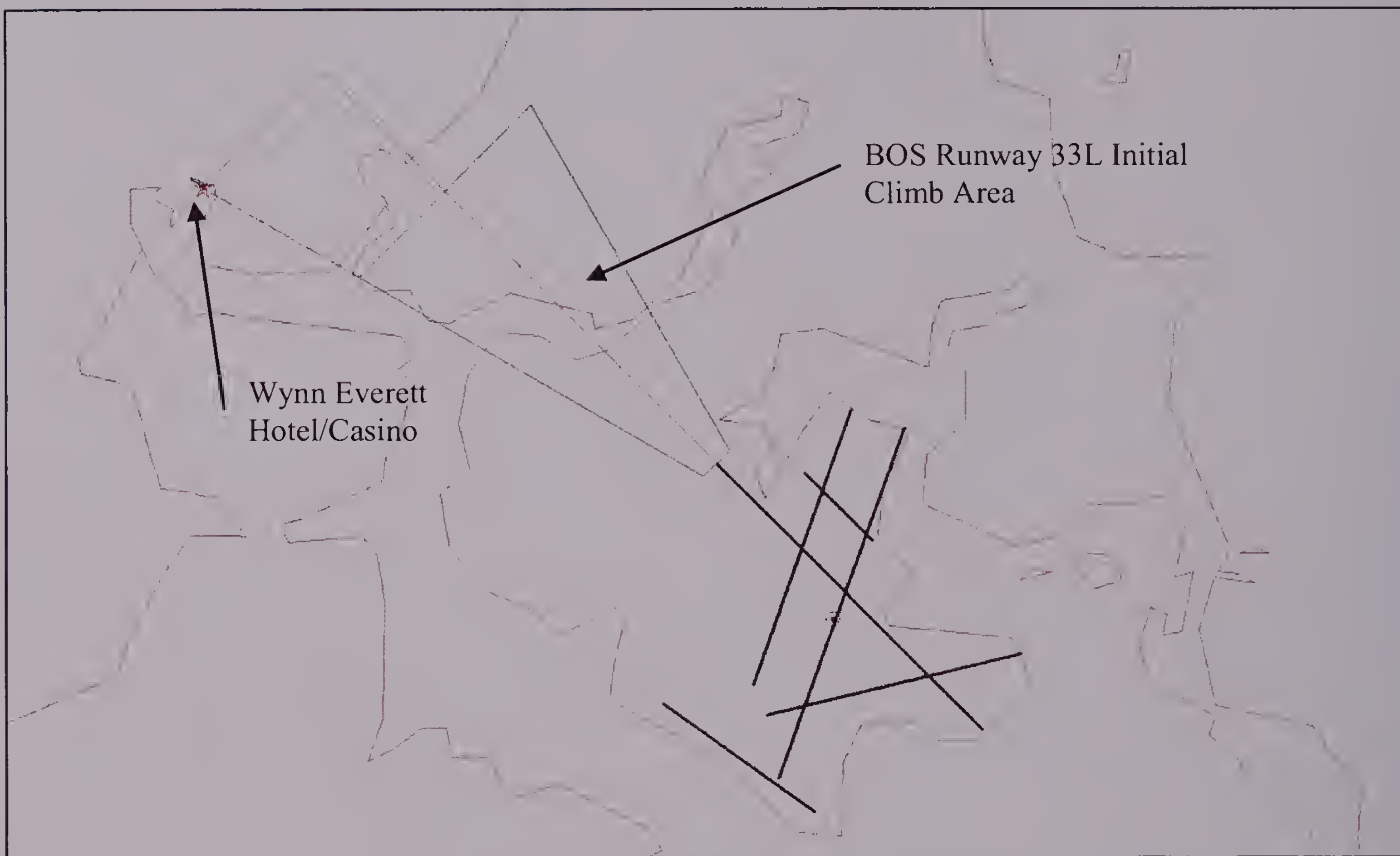
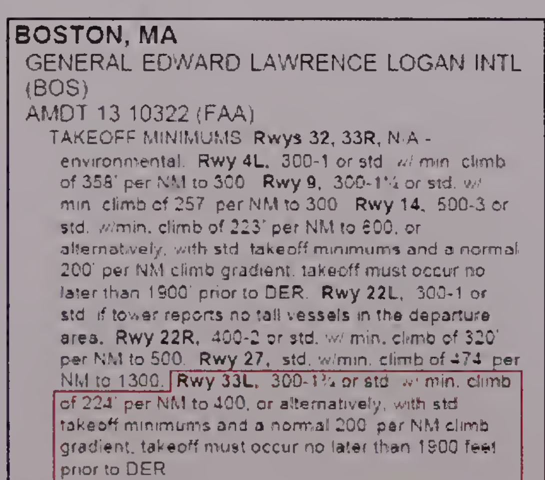


Figure 4: TERPS® image: General Edward Lawrence Logan International Airport (BOS) Runway 33L Departure Procedure

The Wynn Everett Hotel/Casino is within the General Edward Lawrence Logan International Airport (BOS) Runway 33L Diverse A Departure. The maximum allowable height within the Runway 33L Diverse A Departure Procedure ranges from 428 feet AMSL to 439 feet AMSL. The FAA will initially analyze the sites using the standard 40:1 climb gradient (200ft/NM), which will yield a lower maximum allowable heights (396'/NM – 407'/NM). The actual climb gradient for the Runway 33L Departure is 224 feet per NM. Any structure that penetrates the 40:1 surface will likely receive an initial Notice of Presumed Hazard from the FAA.



BOSTON, MA
GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
AMDT 13 10322 (FAA)
TAKEOFF MINIMUMS **Rwys 32, 33R,** N/A - environmental. **Rwy 4L,** 300-1 or std w/ min climb of 358' per NM to 300. **Rwy 9,** 300-1¼ or std. w/ min climb of 257' per NM to 300. **Rwy 14,** 500-3 or std. w/min. climb of 223' per NM to 600, or alternatively, with std takeoff minimums and a normal 200' per NM climb gradient, takeoff must occur no later than 1900' prior to DER. **Rwy 22L,** 300-1 or std if tower reports no tall vessels in the departure area. **Rwy 22R,** 400-2 or std. w/ min. climb of 320' per NM to 500. **Rwy 27,** std. w/min. climb of 474' per NM to 1300. **Rwy 33L,** 300-1¾ or std w/ min. climb of 224' per NM to 400, or alternatively, with std takeoff minimums and a normal 200' per NM climb gradient, takeoff must occur no later than 1900 feet prior to DER

When the correct climb gradient is used in the departure calculations, show in
Figure 5, the actual limit ranges from 428 feet AMSL and 439 feet AMSL. The final determination by the FAA may add conditions to their determination with regard to roof mounted antennas and other appurtenances. Runway 33L One Engine Inoperative surface defined by AC 121-91 will not be impacted by the subject building. No change in airport operations is expected due to the subject building.

Figure 5: (BOS) Takeoff Minimums

BOS RWY 32 & RWY 33R Departures

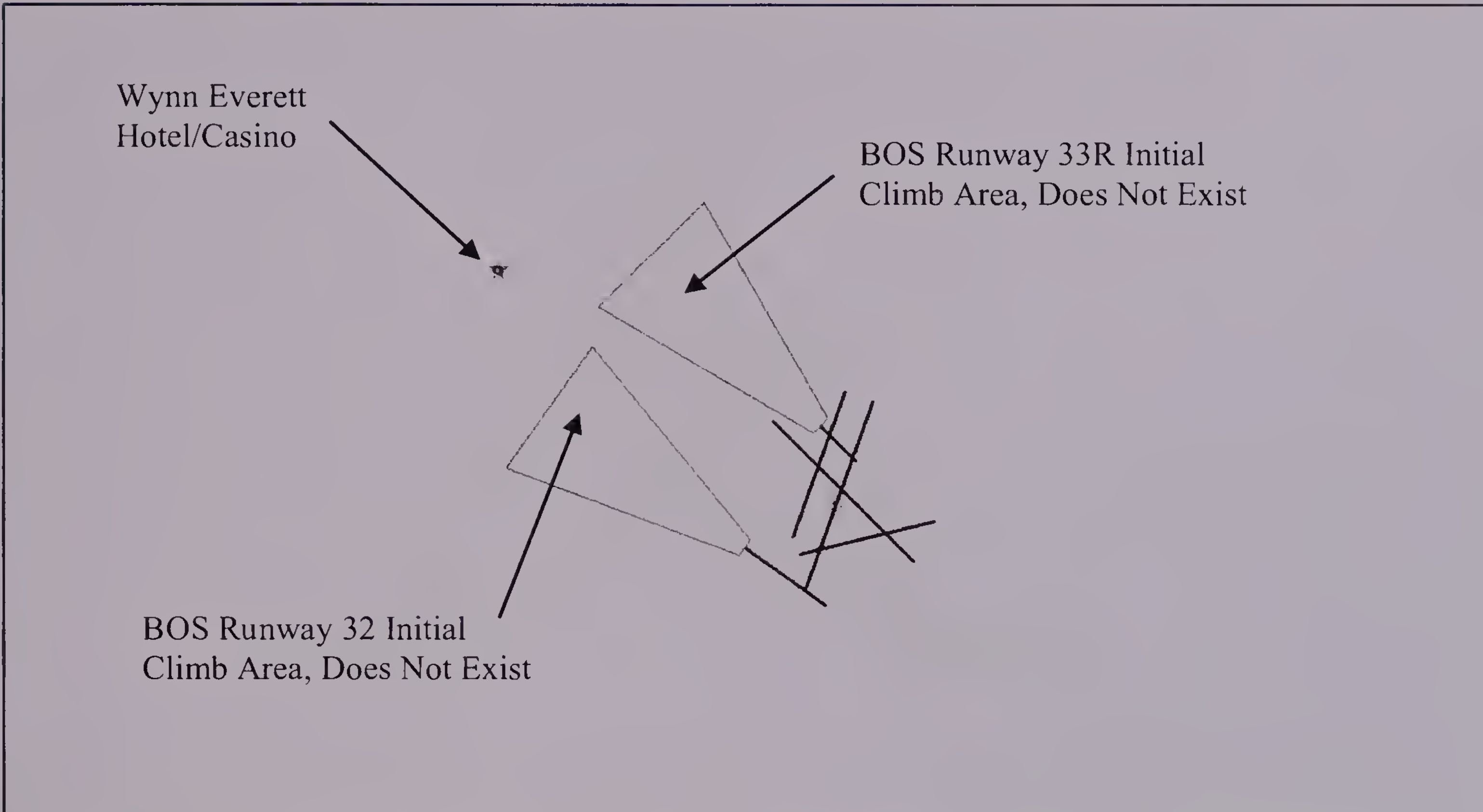


Figure 6: TERPS® image: General Edward Lawrence Logan International Airport (BOS) Runway 32 and Runway 33R Departure Procedure

The General Edward Lawrence Logan International Airport (BOS) Runway 32 and Runway 33R do not have Departure Procedures due to the environmental conditions. This is shown in Figure 7 Takeoff Minimums below.

BOSTON, MA
GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
AMDT 13 10322 (FAA)
TAKEOFF MINIMUMS: **Rwys 32, 33R**, N/A - environmental. **Rwy 4L**, 300-1 or std. w/ min. climb of 358' per NM to 300. **Rwy 9**, 300-1¼ or std. w/ min. climb of 257' per NM to 300. **Rwy 14**, 500-3 or std. w/min. climb of 223' per NM to 600, or alternatively, with std. takeoff minimums and a normal 200' per NM climb gradient, takeoff must occur no later than 1900' prior to DER. **Rwy 22L**, 300-1 or std. if tower reports no tall vessels in the departure area. **Rwy 22R**, 400-2 or std. w/ min. climb of 320' per NM to 500. **Rwy 27**, std. w/min. climb of 474' per NM to 1300. **Rwy 33L**, 300-1¾ or std. w/ min. climb of 224' per NM to 400, or alternatively, with std. takeoff minimums and a normal 200' per NM climb gradient, takeoff must occur no later than 1900 feet prior to DER.

Figure 7: General Edward Lawrence Logan International Airport (BOS) Takeoff Minimums

BOS LNAV RWY 15R Instrument Approach Procedure

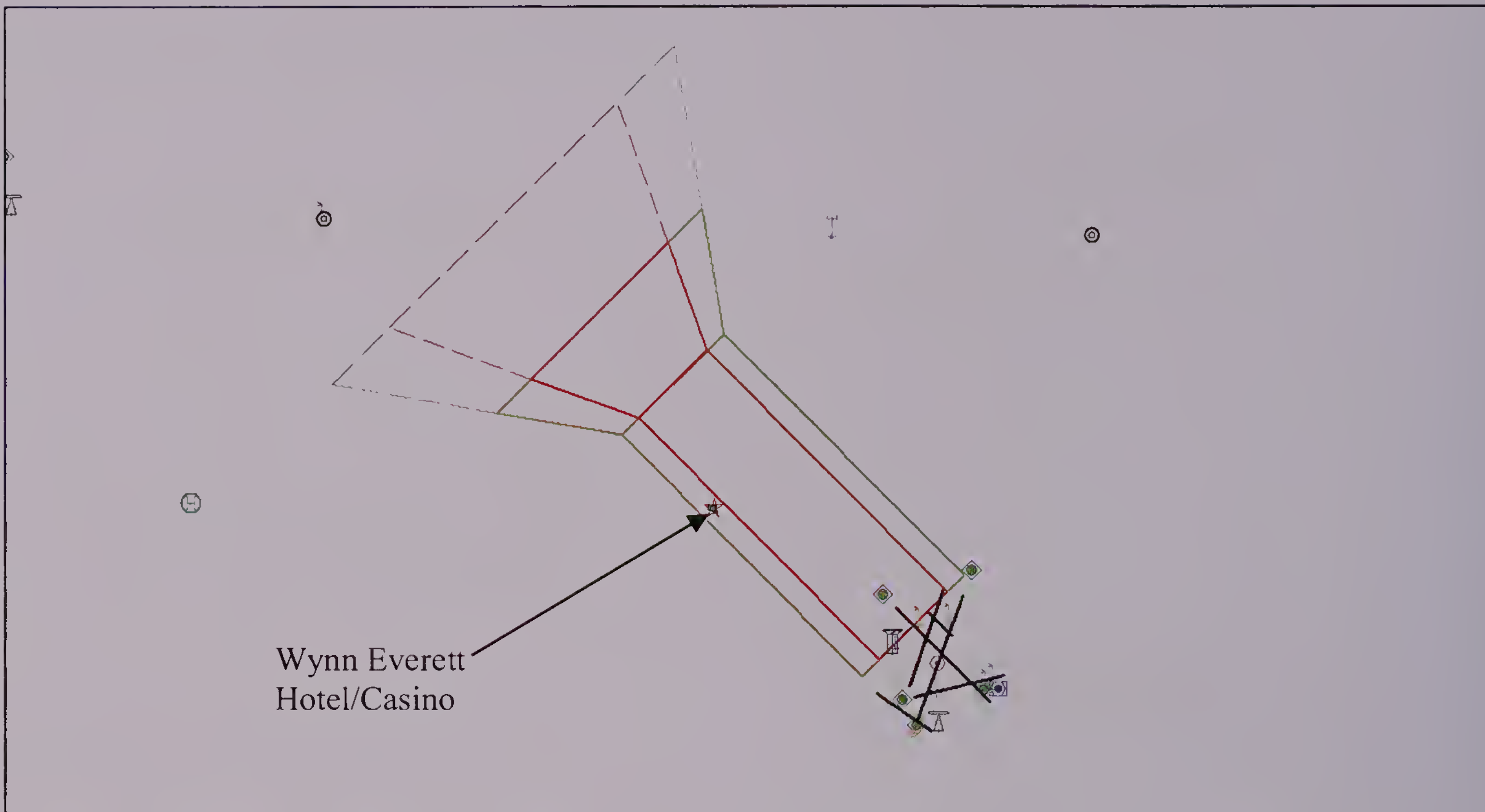


Figure 8: TERPS® image: General Edward Lawrence Logan International Airport (BOS) LNAV RWY 15R Procedure

The Wynn Everett Hotel/Casino is within the General Edward Lawrence Logan International Airport (BOS) Runway 15R LNAV Procedure Secondary Area as shown in Figure 8. The maximum allowable height within the Runway 15R LNAV Secondary Area, highlighted in green, ranges from 485 feet AMSL to 503 feet AMSL.

Any structures penetrating the Approach Procedure will receive a Notice of Presumed Hazard from the FAA. See Appendix A: BOS RNAV (GPS) Runway 15R Procedure Approach Plate for further details.

BOS VNAV RWY 15R Instrument Approach Procedure

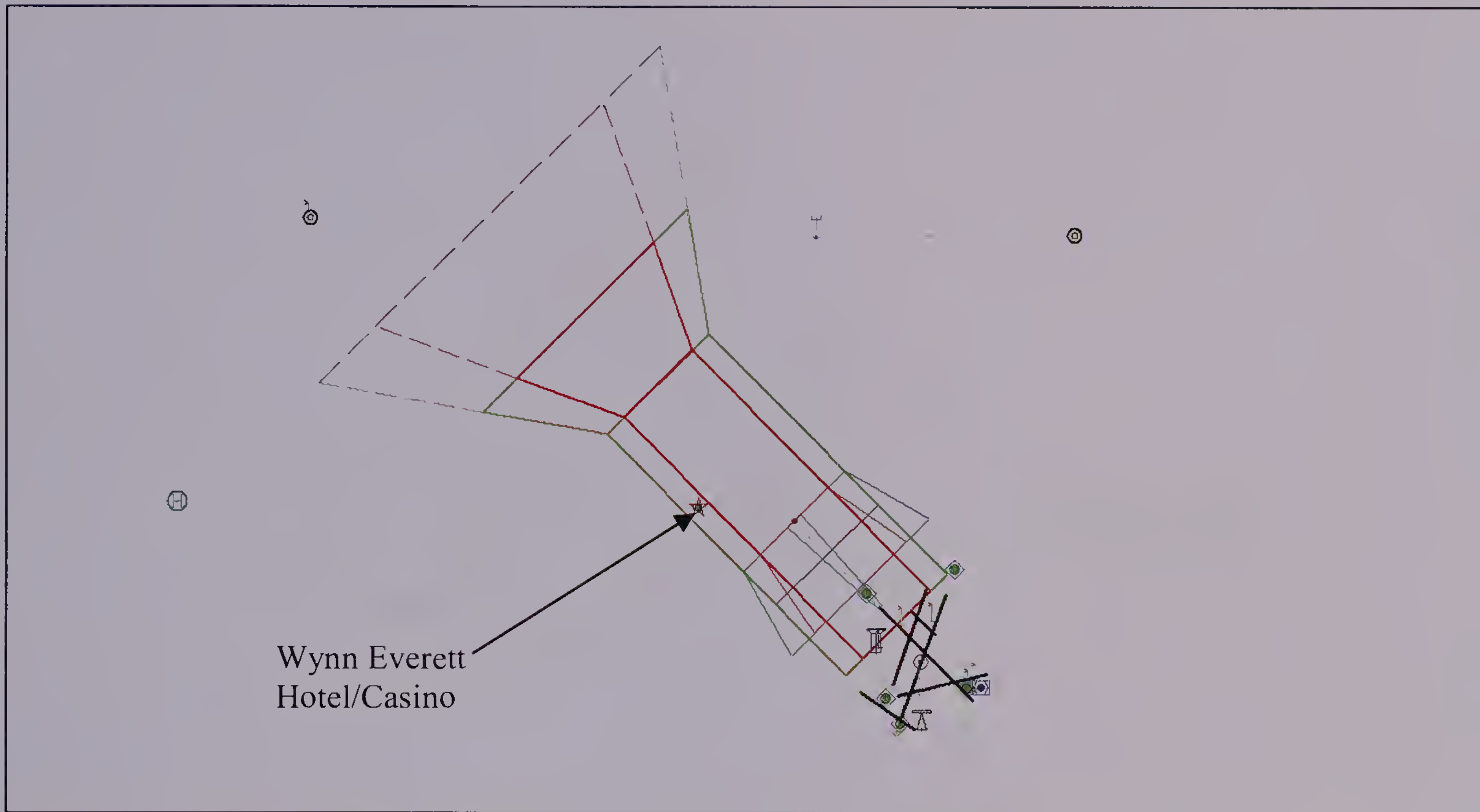


Figure 9: TERPS® image: General Edward Lawrence Logan International Airport (BOS) VNAV RWY 15R Procedure

The Wynn Everett Hotel/Casino is within the General Edward Lawrence Logan International Airport (BOS) Runway 15R VNAV Procedure Secondary Area as shown in Figure 9. The maximum allowable height within the Runway 15R VNAV Secondary Area, highlighted in green, ranges from 623 feet AMSL to 658 feet AMSL.

Any structures penetrating the Approach Procedure will receive a Notice of Presumed Hazard from the FAA. See Appendix A: BOS RNAV (GPS) Runway 15R Procedure Approach Plate for further details.

BOS VOR RWY 15R Instrument Approach Procedure

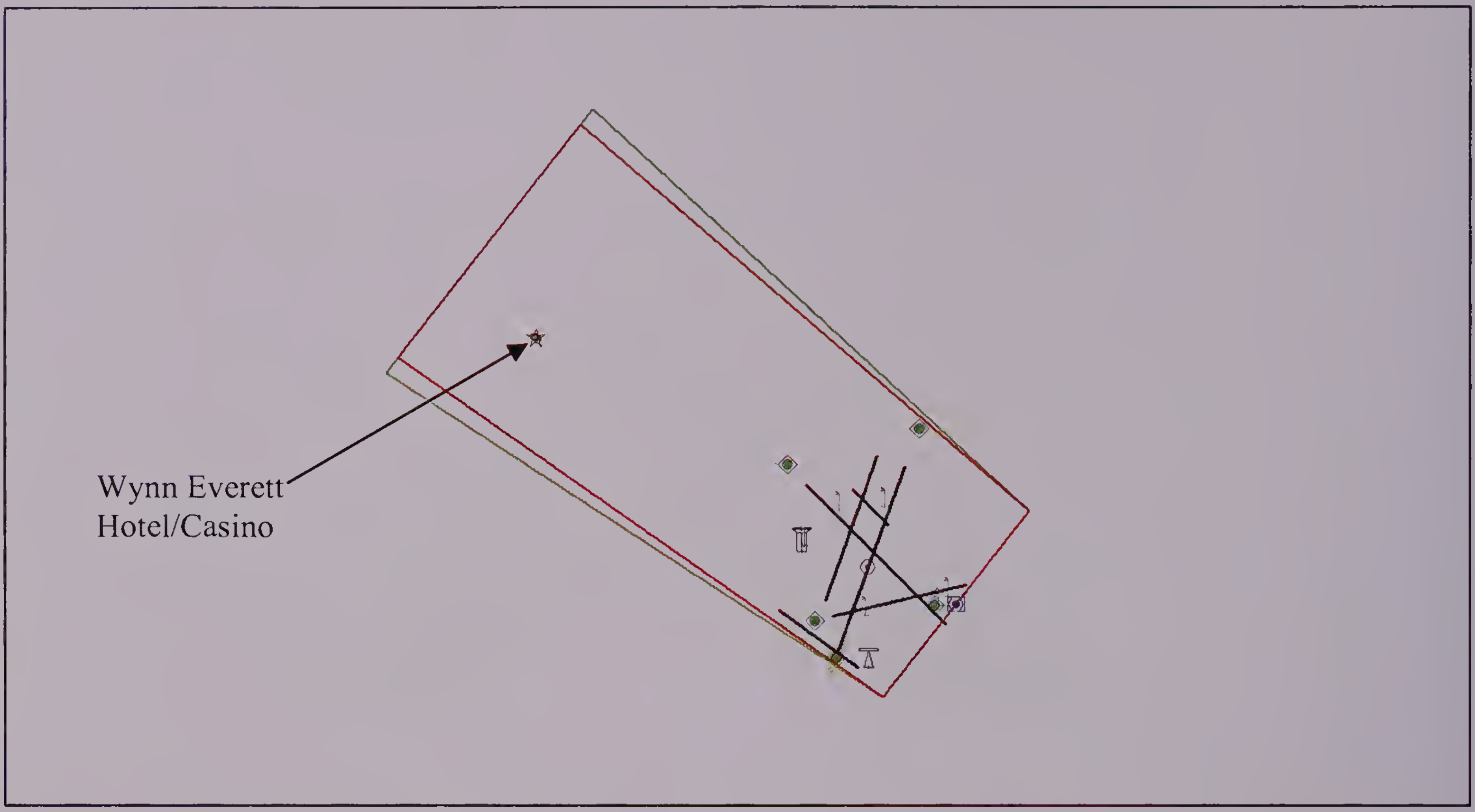


Figure 10: TERPS® image: General Edward Lawrence Logan International Airport (BOS) VOR RWY 15R Procedure

The Wynn Everett Hotel/Casino is within the General Edward Lawrence Logan International Airport (BOS) Runway 15R VOR Procedure Primary Area as shown in Figure 10. The maximum allowable height within the Runway 15R VOR Primary Area, highlighted in red, is 530 feet AMSL.

Any structures penetrating the Approach Procedure will receive a Notice of Presumed Hazard from the FAA. See Appendix B: BOS VOR Runway 15R Procedure Approach Plate for further details.

Radio Communication Link (RCL) Propagation Path

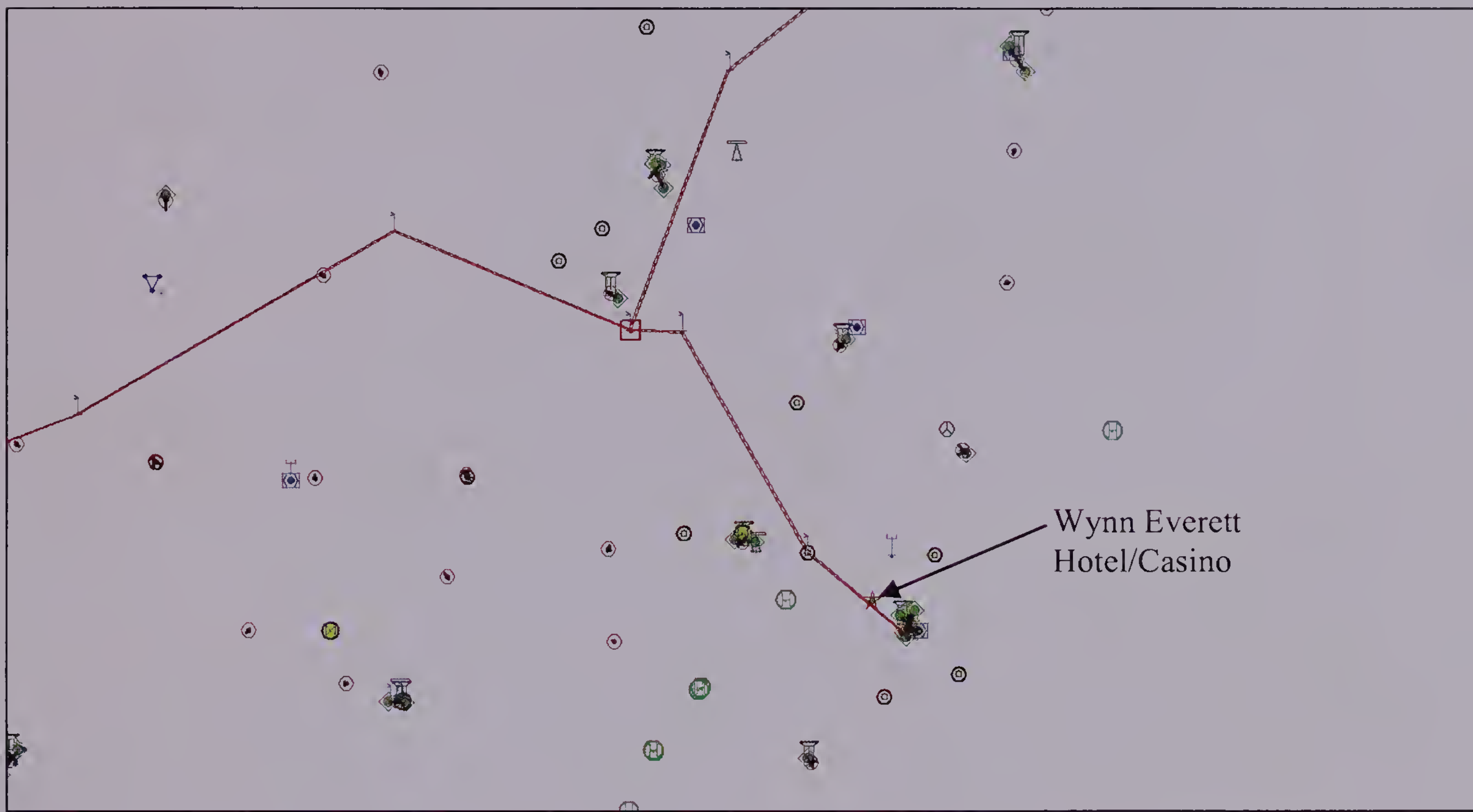


Figure 11: TERPS® image: Existing RCL (Radio Communication Link) Propagation Path located near the Wynn Everett Hotel/Casino.

There is an existing RCL (Radio Communication Link) Propagation Path located approximately 1955 feet from the Wynn Everett Hotel/Casino as shown in Figure 11. The proposed project is not likely to interfere with any FAA microwave communications.

Low Altitude Victor Airways

Impact of the Low Altitude Victor Airway V1

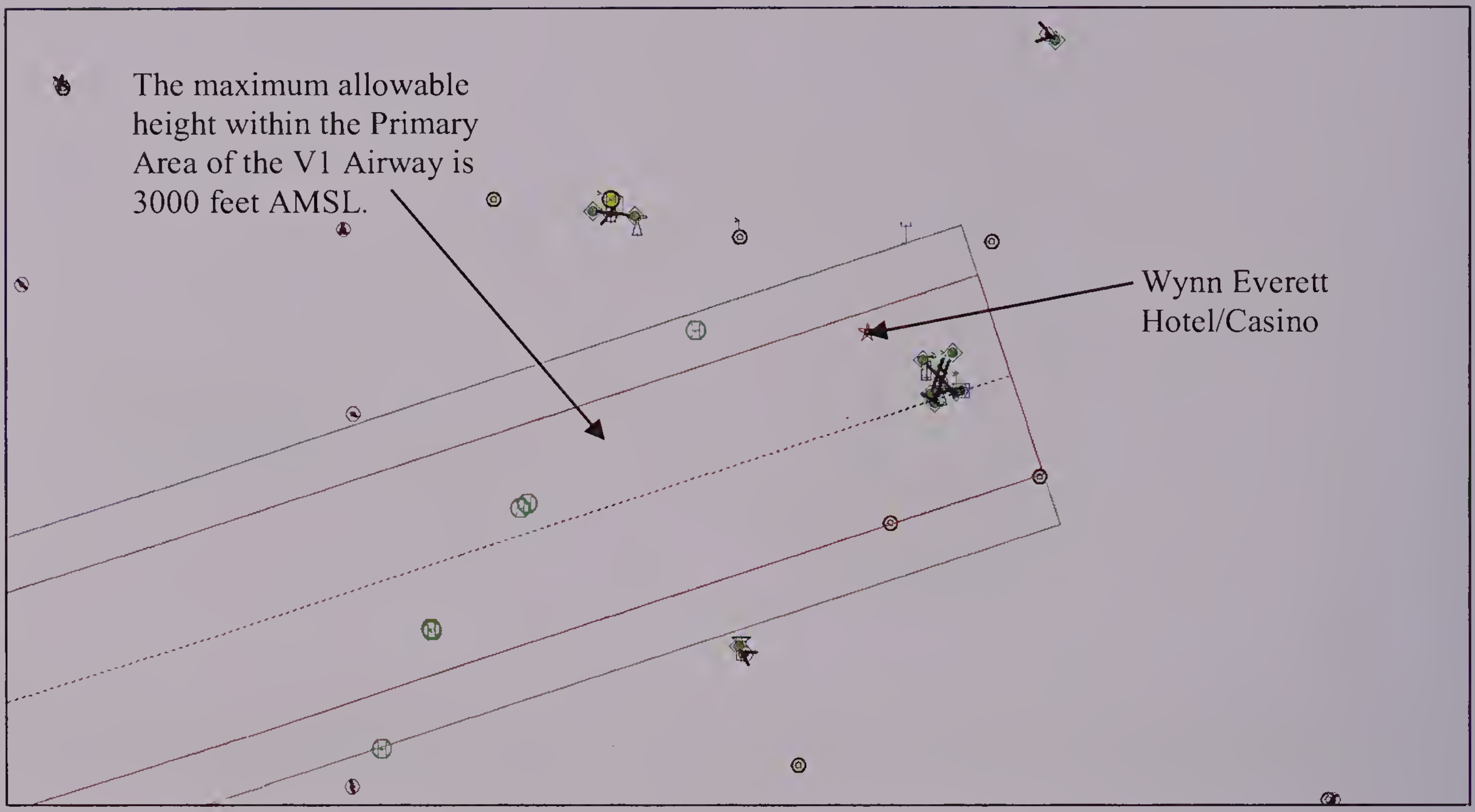


Figure 12: TERPS® image: A portion of the V1 Airway extending over the Wynn Everett Hotel/Casino.

The Low Altitude Victor Airway V1 extends over the Wynn Everett Hotel/Casino as shown in Figure 12. The maximum allowable height within the Primary Area of the V1 Airway, highlighted in red, is 3000 feet AMSL based upon the Minimum En-route Altitude (MEA: 4000 ft) and 1500 feet AMSL which is based upon the Minimum Obstacle Clearance Altitude (MOCA: 2500 feet).

Impact of the Low Altitude Victor Airway V3

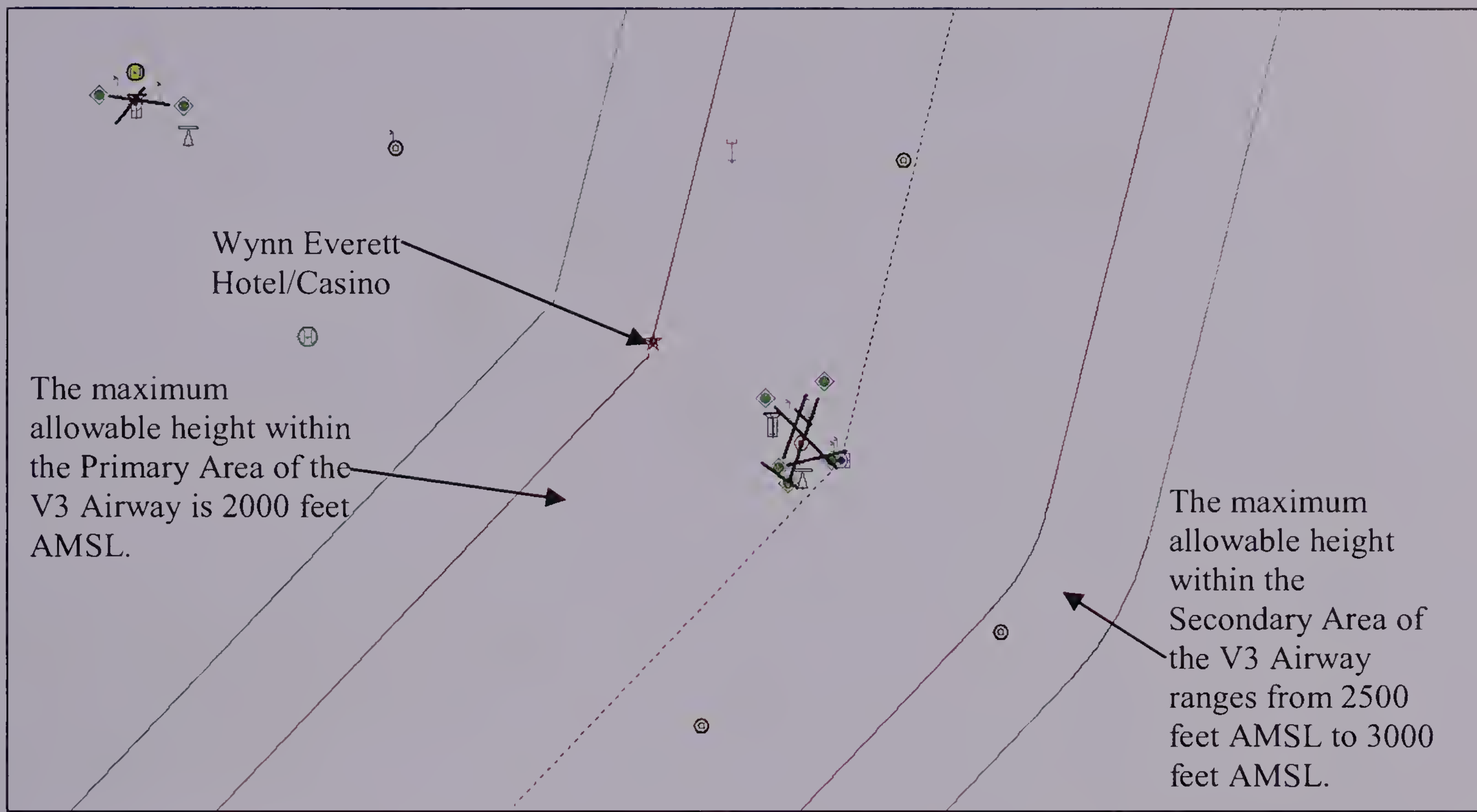


Figure 13: TERPS® image: The portion of the V3 Airway extending over the Wynn Everett Hotel/Casino.

The Low Altitude Victor Airway V3 extends over the Wynn Everett Hotel/Casino as shown in Figure 13. The maximum allowable height within the Primary Area of the V3 Airway, highlighted in red, is 2000 feet AMSL. The maximum allowable height within the Secondary Area of the V3 Airway, highlighted in green, ranges from 2500 feet AMSL to 3000 feet AMSL.

Impact of the Low Altitude Victor Airway V16

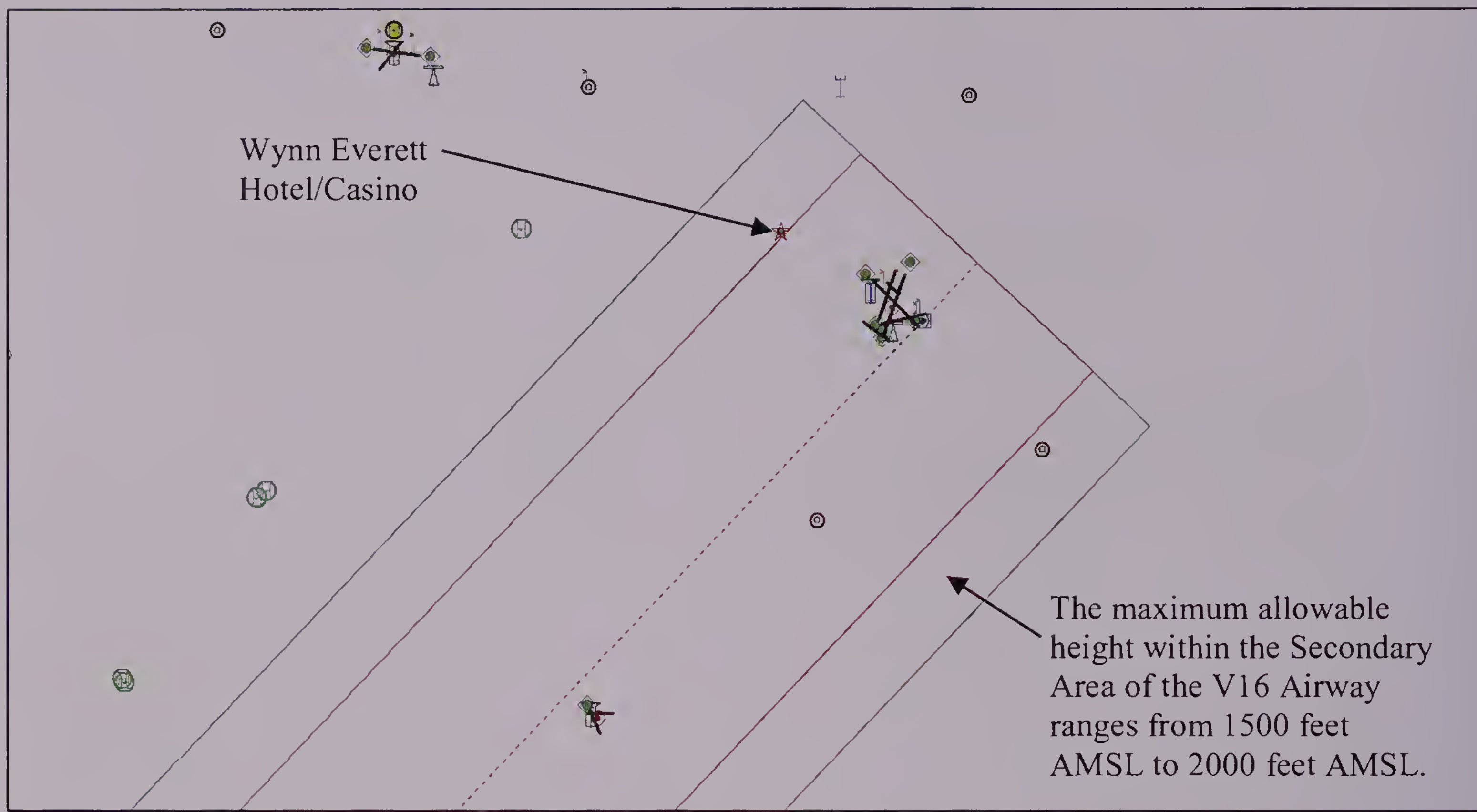


Figure 14: TERPS® image: The portion of the V16 Airway extending over the Wynn Everett Hotel/Casino.

The Low Altitude Victor Airway V16 extends over the Wynn Everett Hotel/Casino as shown in Figure 14. The maximum allowable height within the Secondary Area of the V16 Airway, highlighted in green, ranges from 1500 feet AMSL to 2000 feet AMSL.

Impact of the Low Altitude Victor Airway V141

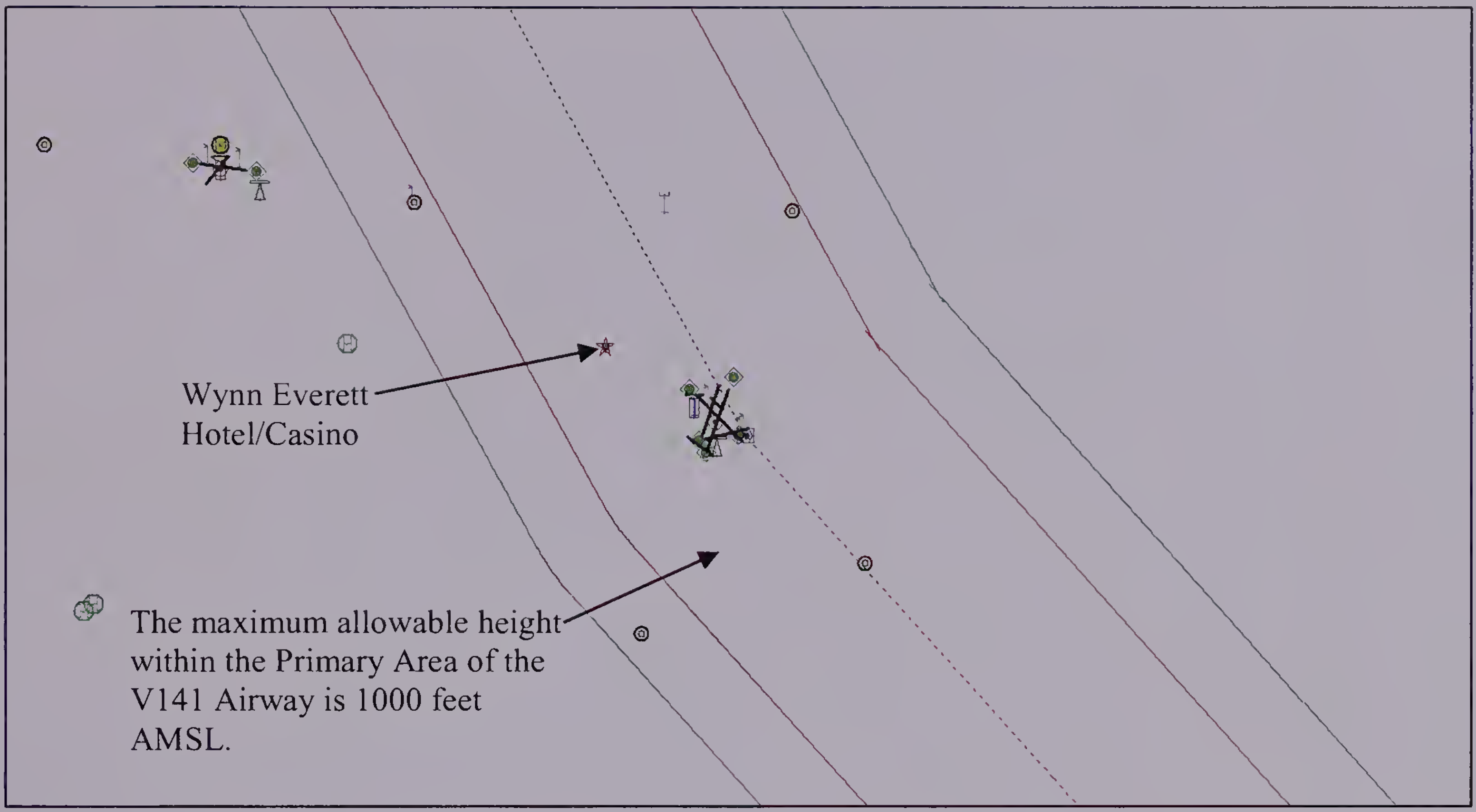


Figure 15: TERPS® image: The portion of the V141 Airway extending over the Wynn Everett Hotel/Casino.

The Low Altitude Victor Airway V141 extends over the Wynn Everett Hotel/Casino as shown in Figure 15. The maximum allowable height within the Primary Area of the V141 Airway, highlighted in red, is 1000 feet AMSL.

Impact of the Low Altitude Victor Airway V270

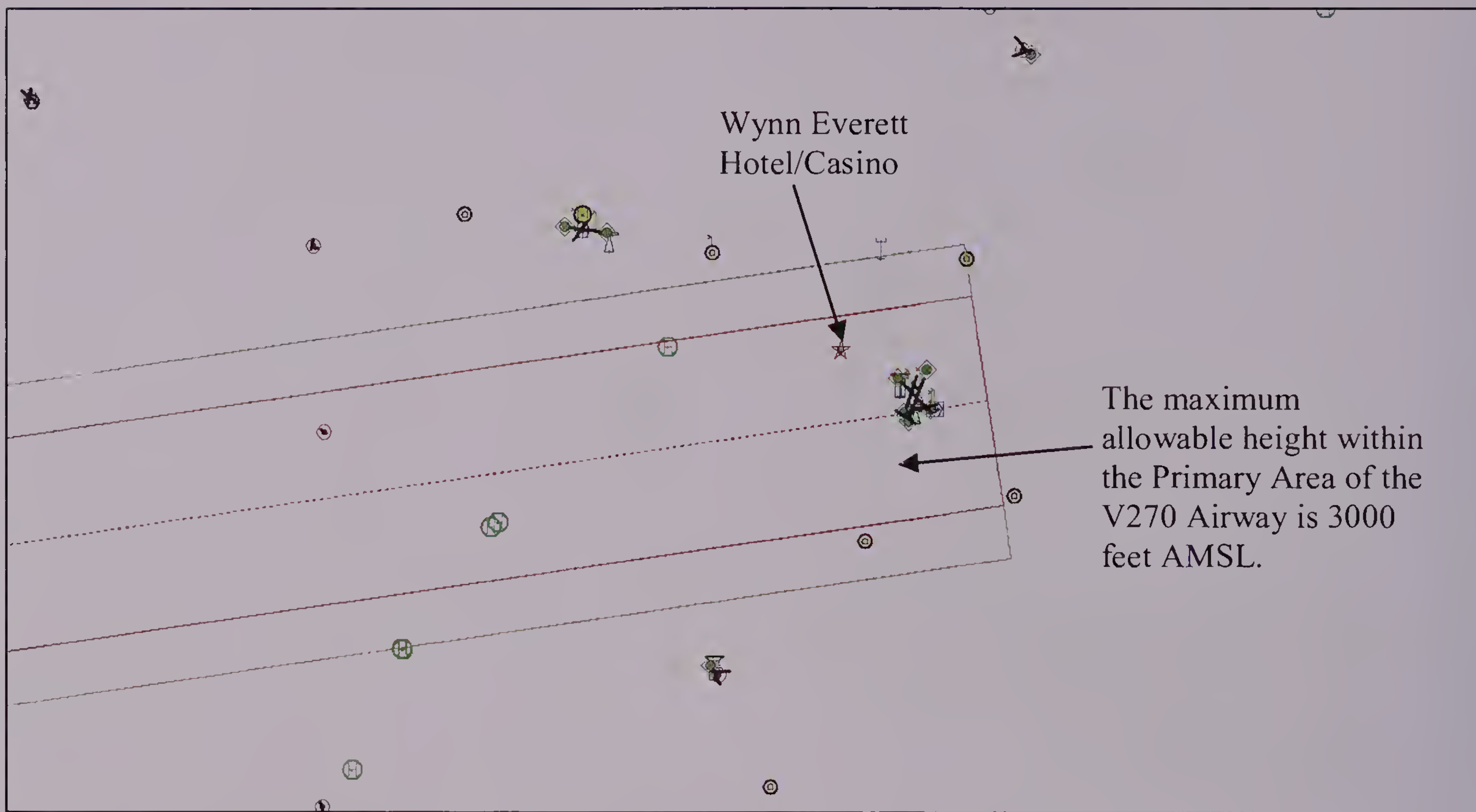


Figure 16: TERPS® image: The portion of the V270 Airway extending over the Wynn Everett Hotel/Casino.

The Low Altitude Victor Airway V270 extends over the Wynn Everett Hotel/Casino as shown Figure 16. The maximum allowable height within the Primary Area of the V270 Airway, highlighted in red, is 3000 feet AMSL.

Impact of BOS Minimum Vectoring Altitudes (MVA)

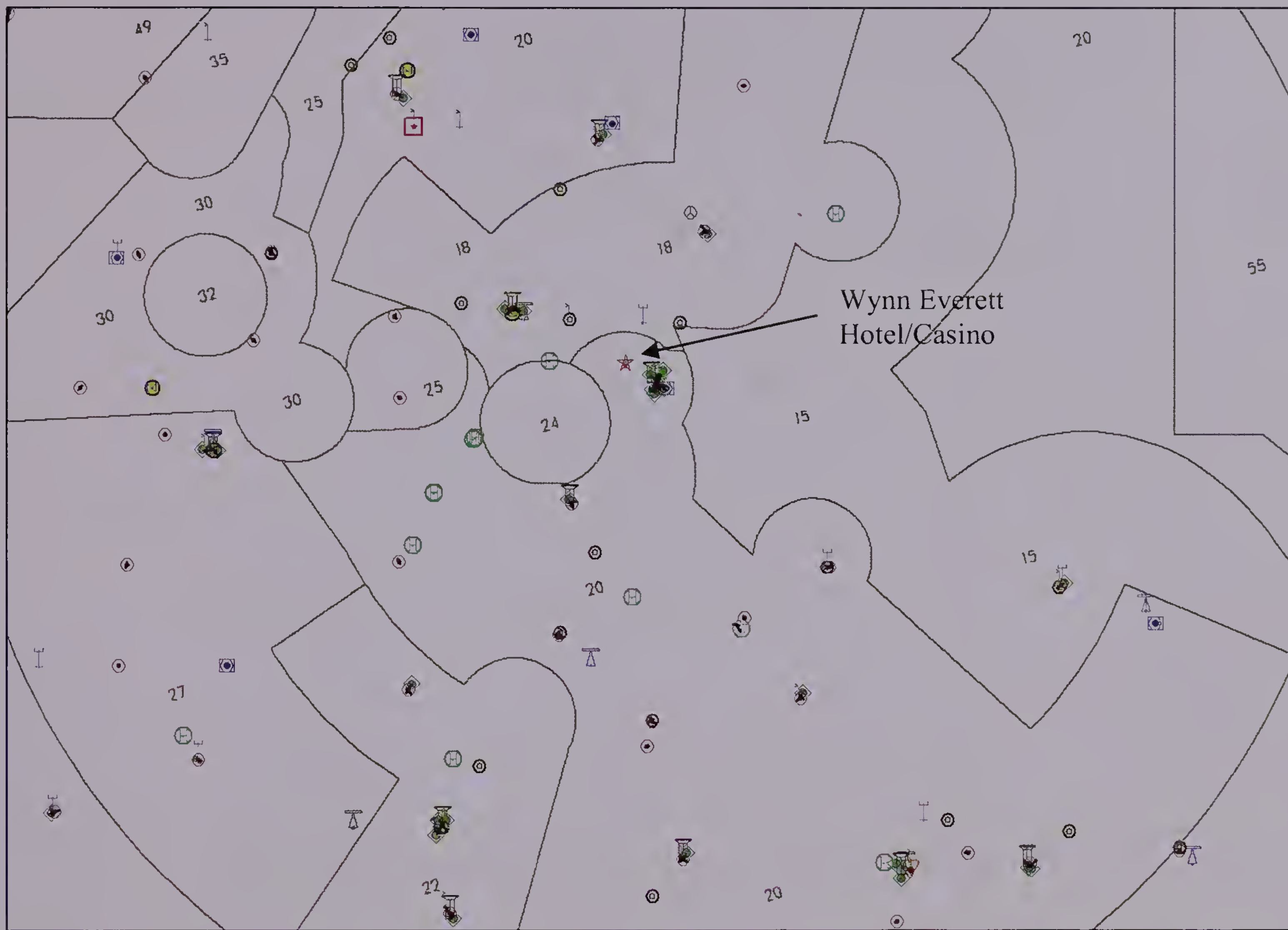


Figure 17: TERPS® image: Boston TRACON (BOS)

The Wynn Everett Hotel/Casino is within the 60 NM operational range of the Boston Consolidated (A90) Terminal Radar Approach Control (TRACON) facility is shown in Figure 17. The maximum allowable height is 1000 feet AMSL. The Wynn Everett Hotel/Casino will not impact the A90 Boston Consolidated TRACON MVA.

RADAR Screening Analysis

ARSR Long Range Radar Screening

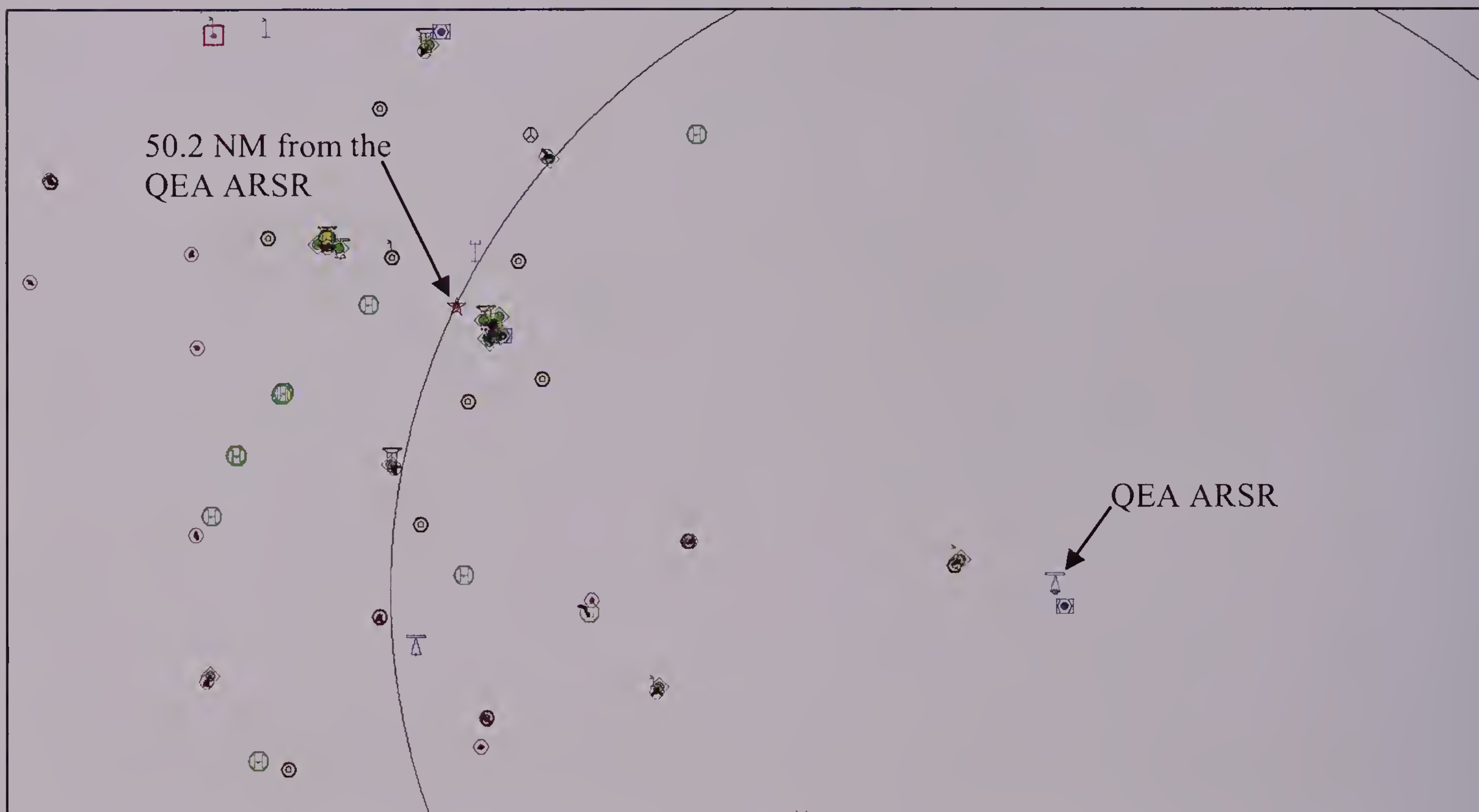


Figure 18: TERPS® Image: ARSR Radar Site ID: QEA

The potential impact of the proposed property development to Air Route Surveillance Radar (ARSR) Long Range Radar facilities was analyzed using both FA&A's proprietary Radar Screening Tool and the FAA/DoD Preliminary Radar screening tool as shown in Figure 18. The nearest ARSR Radar Facility is located approximately 50.2 NM from the subject property and shown in Figure 19. The maximum allowable height dictated by this facility will not be exceeded by the subject building.

Figure 19: Aerial photograph of the QEA Radar Facility.

NEXRAD Radar Screening

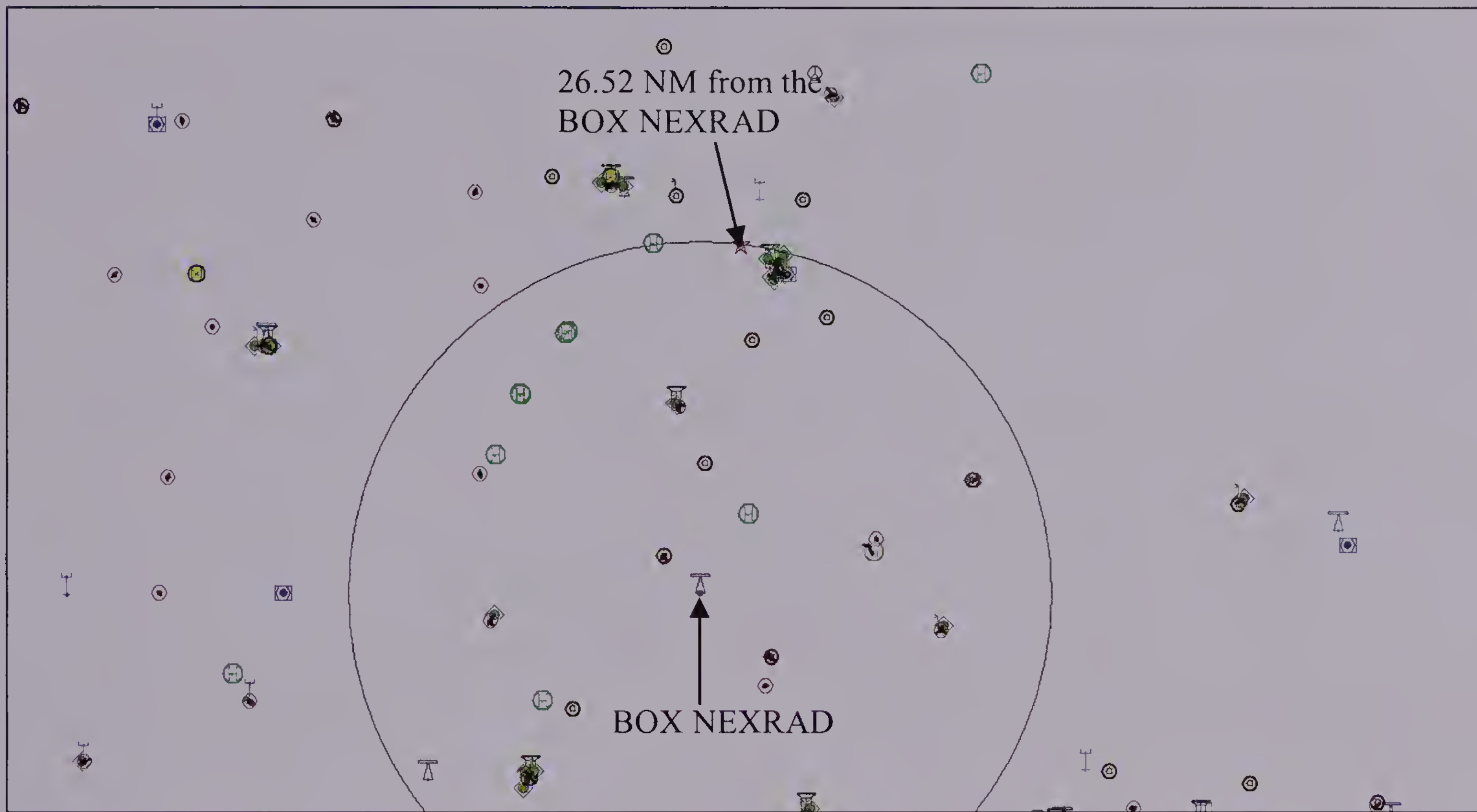


Figure 20: TERPS® Image: NEXRAD Radar Site ID: BOX

The potential impact of the proposed property development to NEXRAD Radar facilities was analyzed using both FA&A's proprietary Radar Screening Tool, Figure 20, and the FAA/DoD Preliminary Radar screening tool, Figure 21. The nearest NEXRAD Radar Facility is located approximately 26.52 NM from the subject property. The maximum allowable height dictated by this facility will not be exceeded by the subject building.

Figure 21: NEXRAD screening and aerial photograph of the BOX Radar Facility.

TDWR Radar Screening

This radar operates in the band 5.6 – 5.65 GHz. There are 49 Terminal Doppler Weather Radars systems located near US Airports. These facilities detect severe weather such as sudden updrafts and downdrafts. The BOS TDWR is located approximately 23.5 KM from the BOS Airport Reference Point. This is approximately 0.5 KM further than the prescribed limit of the TDWR radar siting criteria as shown in Figure 22. The subject building is 28.5 KM from the BOS TDWR and a 0.5 degree beam tilt will extend nearly 1000' above the subject building. Detection of a micro-burst is one of the primary uses of the TDWR. The coverage area is 1 NM wide and extends 3 NM past the runway threshold on approach. There is no shielding by the subject building of this area for either Runways 15R or 14.

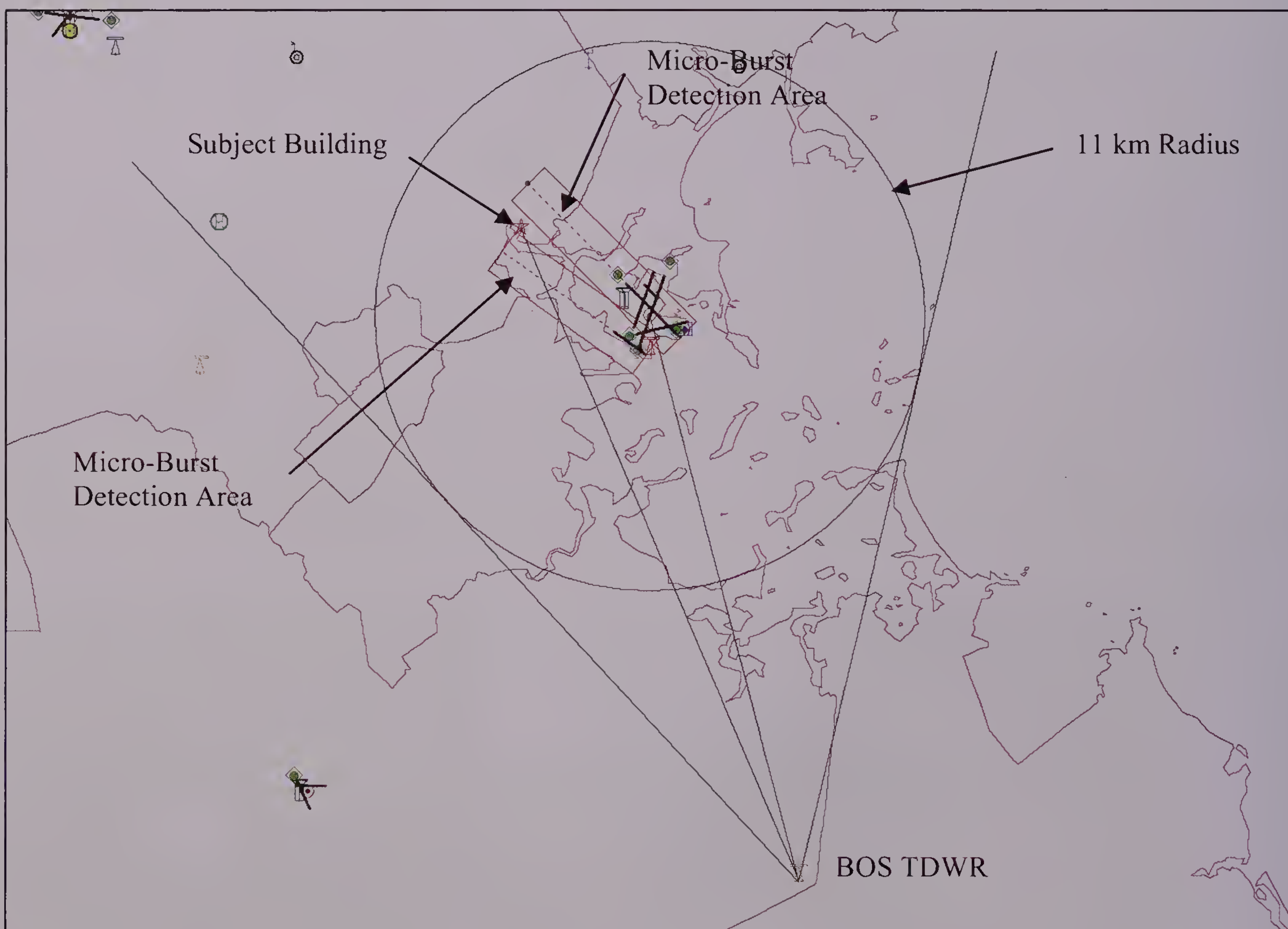


Figure 22: BOS TDWR Coverage Area.

It is not anticipated that the subject building will impact micro-burst and gust front detection by the BOS TDWR facility.

Airport Surveillance Radar (ASR) Radar Screening

Boston, like many large cities, has numerous tall buildings. Many of these buildings do cause reflections and shielding of radar and beacon signals. Beacon false targets are caused by beacon signal reflections near the radar site. Ideally, a radar beacon system will elicit beacon signal returns from properly equipped aircraft only when the beacon antenna is pointed directly at the aircraft. The beacon signal path in this case is termed the primary path and the beacon target will be displayed on the radar scope at the correct azimuth, or bearing.

If a good RF reflector exists near the radar site and is also illuminated or "seen", by the radar beacon RF radiation pattern of the antenna – and is also properly oriented to reflect this beacon signal to a beacon equipped aircraft the beacon signal can also reach the aircraft when the beacon antenna is pointing not to the aircraft, but to the beacon reflector. This reflection path can cause an apparently valid beacon target to appear on the radar scope, but at the azimuth or bearing of the reflection source and since the reflection path is longer than the primary path at greater range. This apparently valid beacon target, appearing on the radar display where no actual aircraft exist is called a beacon false target.

The subject project will be "seen" by the BOS ASR facility. The orientation of the building will redirect radar signal energy from the direction the radar antenna is pointing. In addition, the structure will add additional shielding of the radar signal. There is an existing structure located in the direct radar Line-Of-Sight (LOS) between the subject project and the Boston Logan Airport Surveillance Radar (ASR). This structure (ASN: 2001-ANE-671-OE) is a large stack which will eliminate the ability of the BOS ASR from iluminating the entire subject structure. The portion of the subject project located below the 348 feet AMSL height will not be visible to the radar within the shielded area. This will limit the amount of reflected signal energy. The location of this stack (2001-ANE-671-OE) is included in the FAA's Obstacle Data File (ODF). However, the location data does not appear to be accurate and may need to be surveyed to verify the location and height to the FAA.

Actual hotel building coordinates were not provided for this revision and analysis. The coordinates were derived from the 3-D kmz image file of the subject building. The latest design of the subject building is based upon radius of curvature of 432.08 feet and 507.9 feet. These values represent the curve of the outside walls. The azimuth of the building side facing the BOS ASR was estimated to be 339° and the available striking surface is 108 feet. The angle of reflection, reflector length and height are necessary to compute the expected range of the reflection path signal. This was computed and determined to exceed the range limit of the BOS ASR facility using the radar equation.

$$R_i = \sqrt{\frac{P_a \; G_a \; G_t \; A_{eff}^2}{(4\pi)^2 \; R_f^2 \; S_{min} \; L_s}}$$

Figure 23: Radar Equation

Graphical analyses of the reflected energy along specific paths were conducted to determine the impact of the reflected signal. The incident angle of the radar signal from the ASR to the subject project is approximately 314.7° for Path A. The reflected angle is approximately 159.9°. Because the end of the subject building has been redesigned with a curved and flat surface is not anticipated that the east building end will create false targets. The shape will disperse the radar energy in such a manner that impact to Air Traffic will not occur. It will be important that a detailed description of the building end be included with the submission to the Federal Aviation Administration for their review. This will include the exact latitude/longitude points and the parameters that form the curve.

The primary reflection path is Path B, which reflects off of the subject building on the 432.08 feet radius side (south) between the southwest corner and a point approximately 125 feet to the east. The reflected energy is at a heading of 256.48° true. This reflection is not in the direction of an approach or a departure flight path. It will, however, interrogate aircraft along Airways and V270-292 making them appear to be on V431. These false targets will likely increase the workload of Air Traffic.

The second possible area of reflection for Path B will be for Aircraft utilizing:

1. VOR to Runway 15R would be at 1300 feet AMSL and could be interrogated by the reflected energy.
2. Aircraft exercising a Missed Approach for the VOR Runway 33L would be at 1500 feet AMSL.
3. Aircraft executing a missed approach for the VOR-A procedure (west of the subject building) would be at 1779 feet AMSL.
4. Aircraft executing a missed approach to Runway 33L (west of the subject building) would be at 1140 feet AMSL.

All of these aircraft can be False Targets which can appear as actual aircraft on Air Traffic Radar displays.

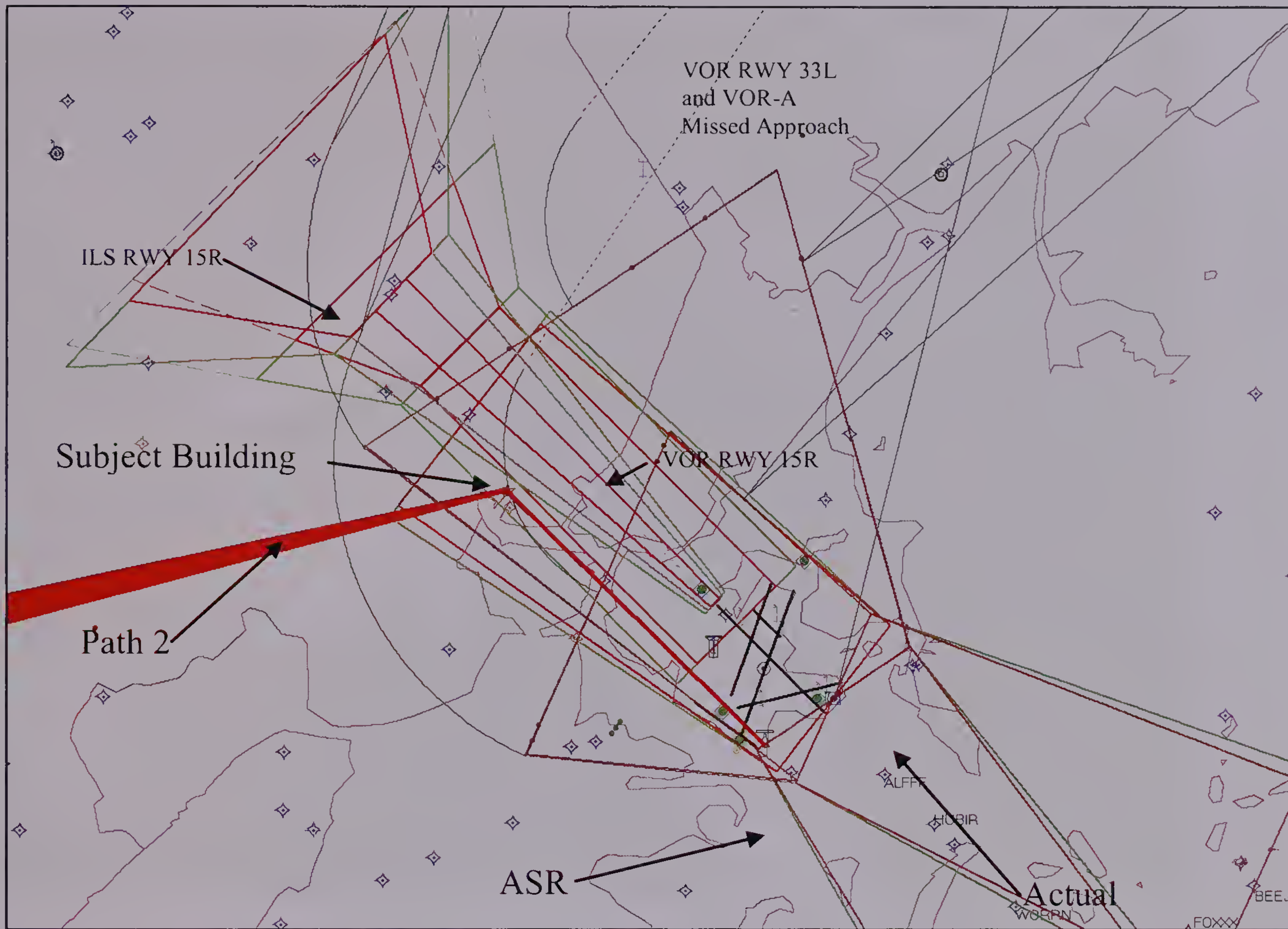


Figure 24: The reflected Paths of the BOS ASR facility.

Path 1 is not shown reflected energy is 'broken up' by shape of building. Path 2 is shown in 'Red'. The ASR is on the Airport pointing to the subject project. The radar signal is reflected off of the building on heading 256.48 degrees. The aircraft beacon signal returns on this same path and would appear as a duplicate aircraft in the wrong location.

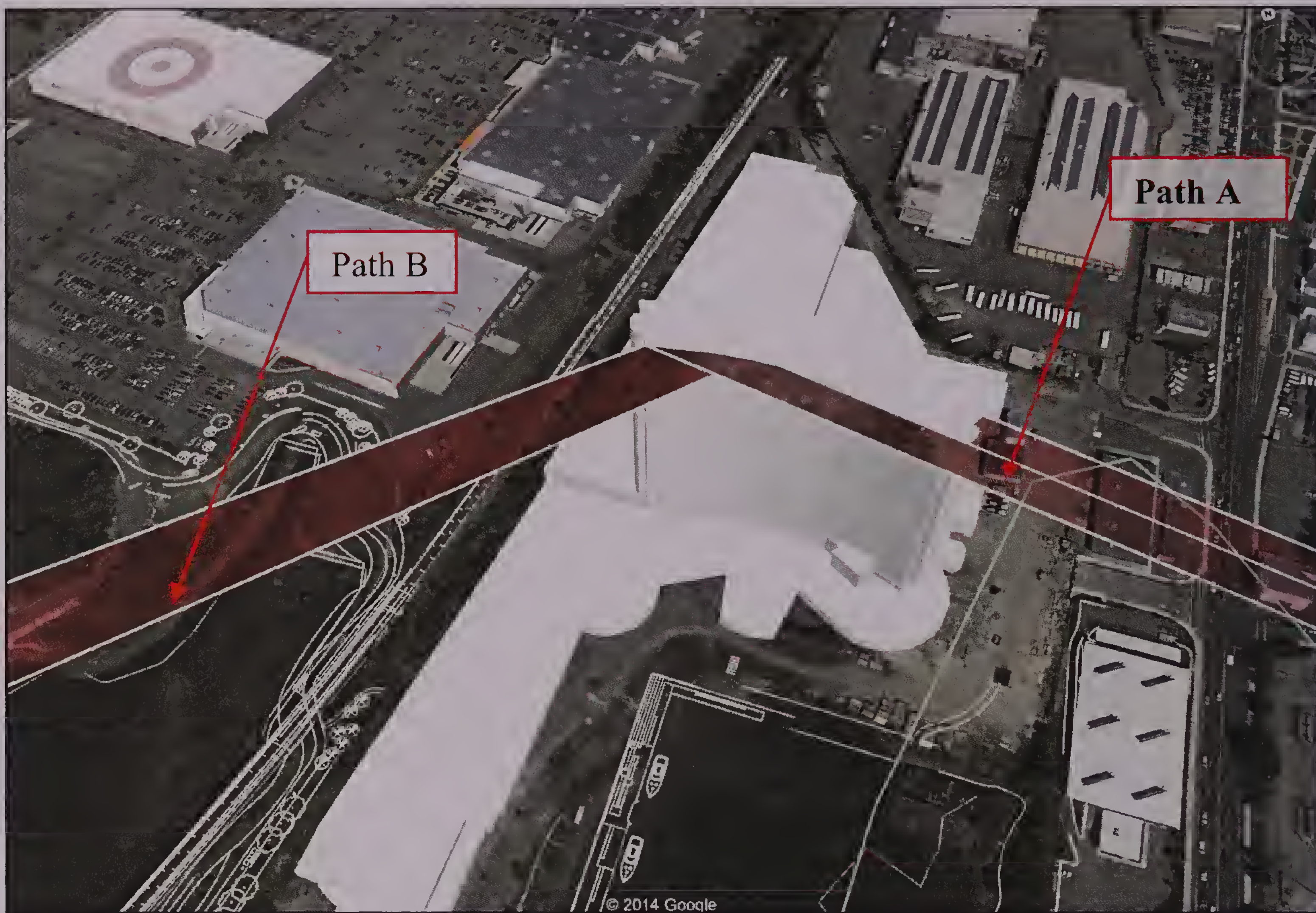


Figure 25: Wynn Hotel Tower with Radar Reflections.

Path A is shown, however, shape of building end will more likely than not dilute any reflective energy. Path B is on heading of approximately 256.48 degrees true.

The false beacon targets generated by the proposed building will add slightly to the cumulative effect. This impact should be seen as insignificant when compared to the impact of the city of Boston itself with respect to reflections and false beacon targets.

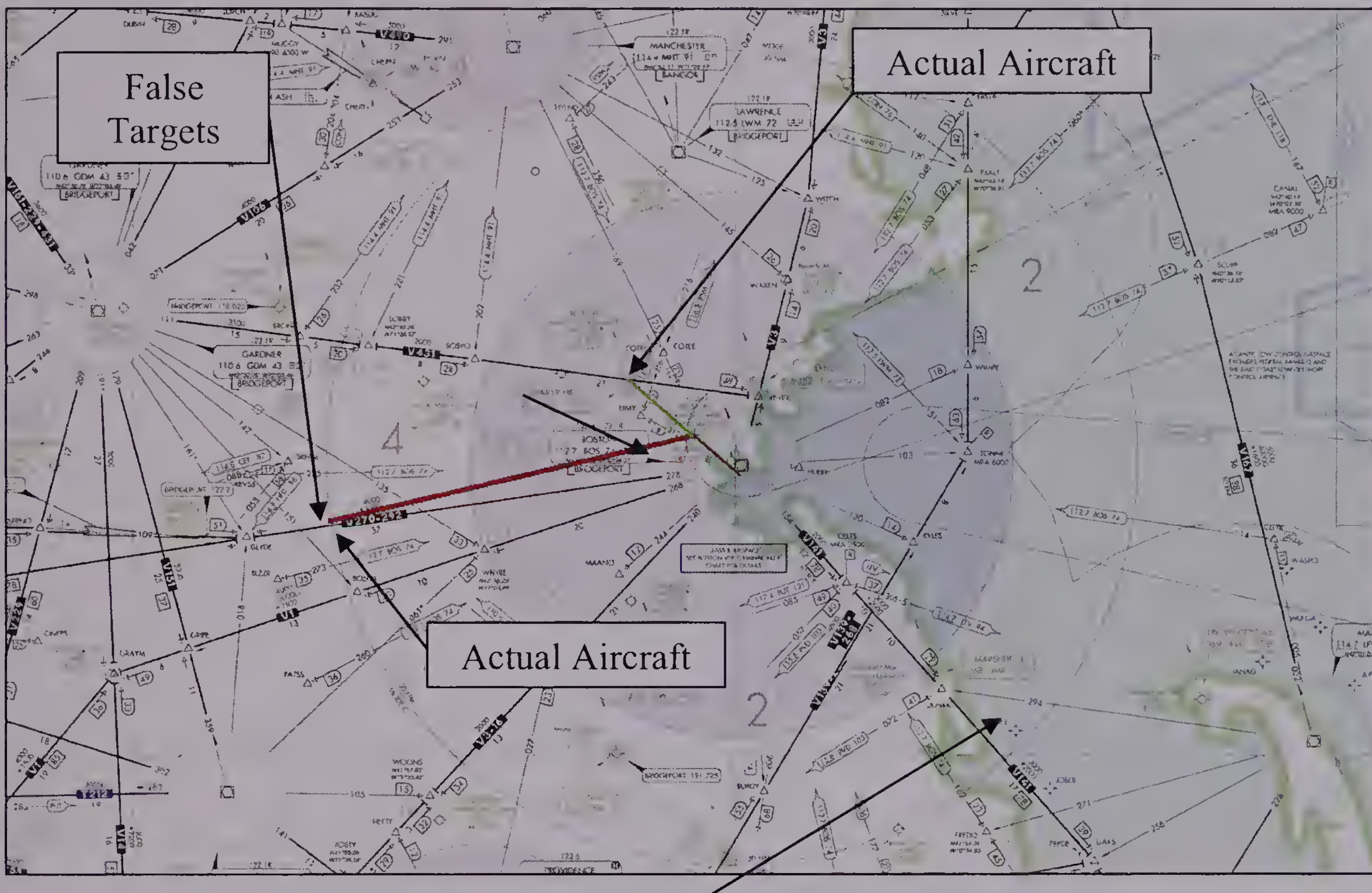


Figure 26: Airway Chart showing location where 'False Targets' will be displayed.

As mentioned above, the subject project will block a portion of the radar and beacon signal to aircraft. Aircraft making a Runway 33L departure climb heading 331° then turn on heading 314° to waypoint "TEKKK." It is during this initial course change between the departure end of the runway (DER) and "TEKKK" that would likely result in the loss of actual targets from the radar display for a brief time. Aircraft climbing at the standard rate would achieve an altitude of 833 feet AMSL within the potential shadow plane.

The height of the shadow plane at this location is 850 feet AMSL and the width of the shadow plane is 278 feet. Aircraft moving at 165 knots per hour will pass through this area in less than one second. This would only be noticed by Air Traffic if the radar sweep is pointed at the subject building at the exact moment an aircraft is in the shadow. SIDs "BLZZR TWO", "BRUWN THREE", "CELTK THREE", "HYLND THREE", "LBSTA THREE", "PATSS THREE", "REVSS TWO" and "SSOXS THREE", are the specific departure procedures where this will occur.

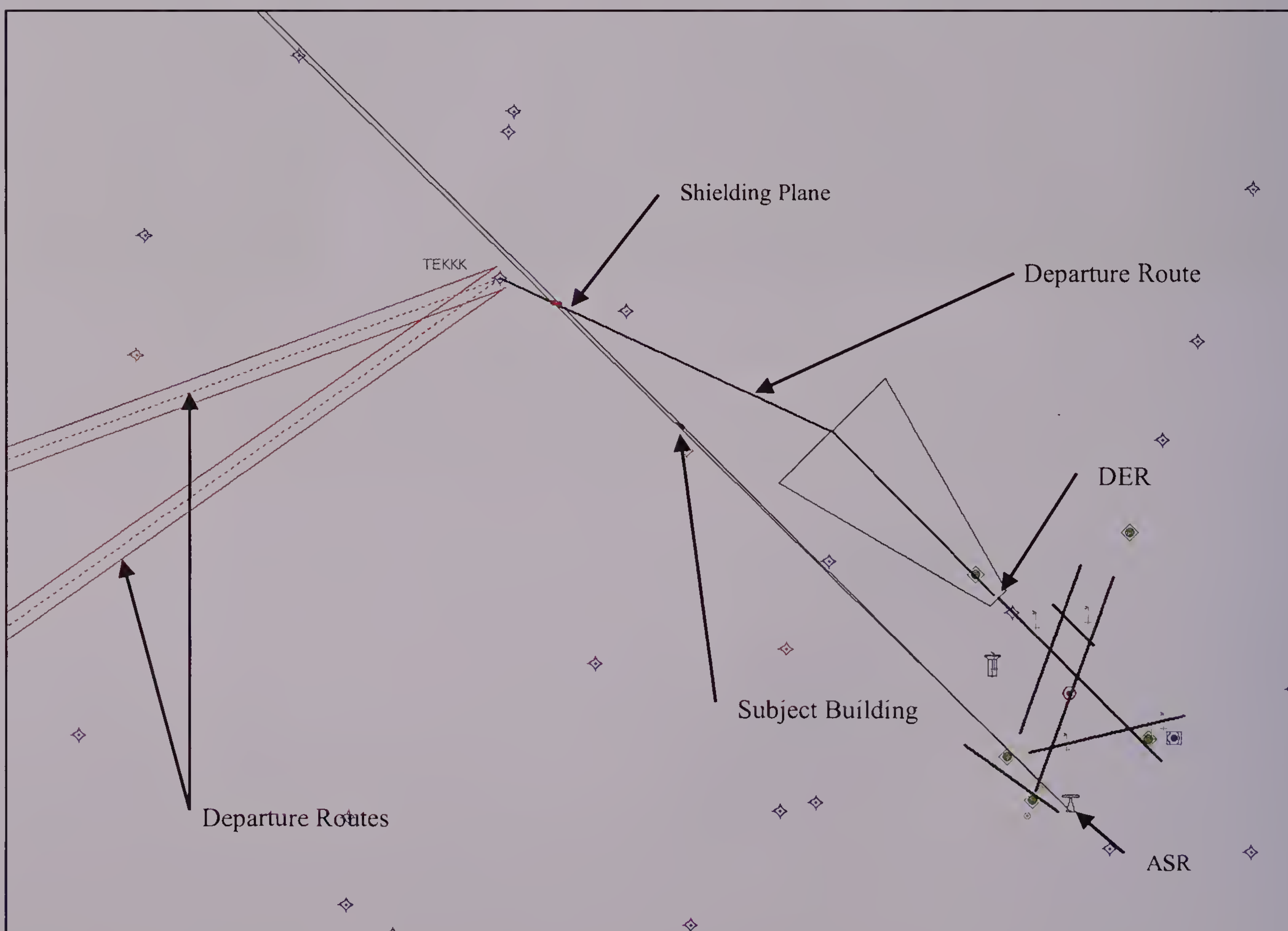


Figure 27: Standard Instrument Departures (SID) for Boston Logan Airport. Runway 33L climb to area between the DER (Runway 15R) and the waypoint TEKKK is the only area where shielding could occur.

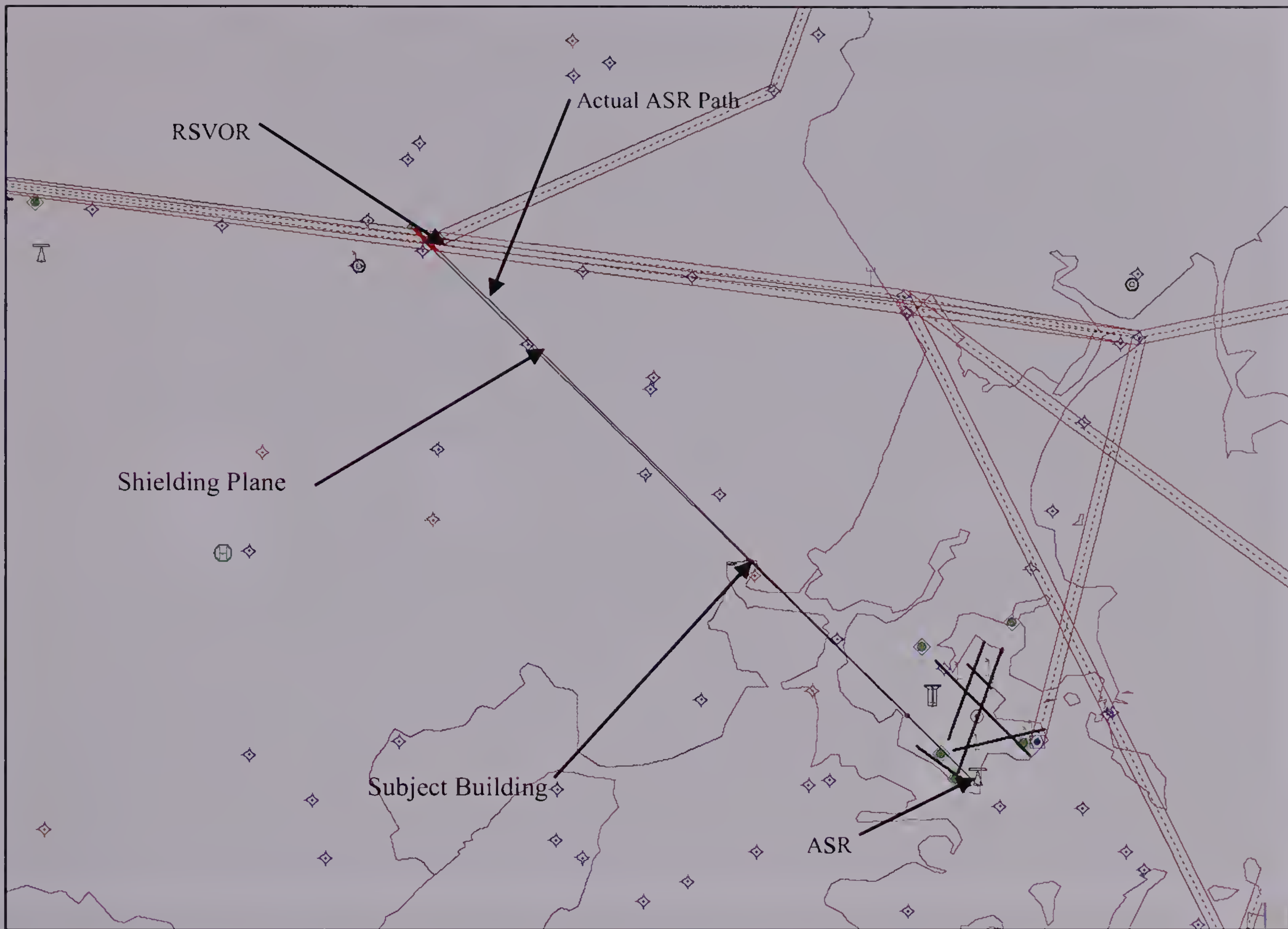
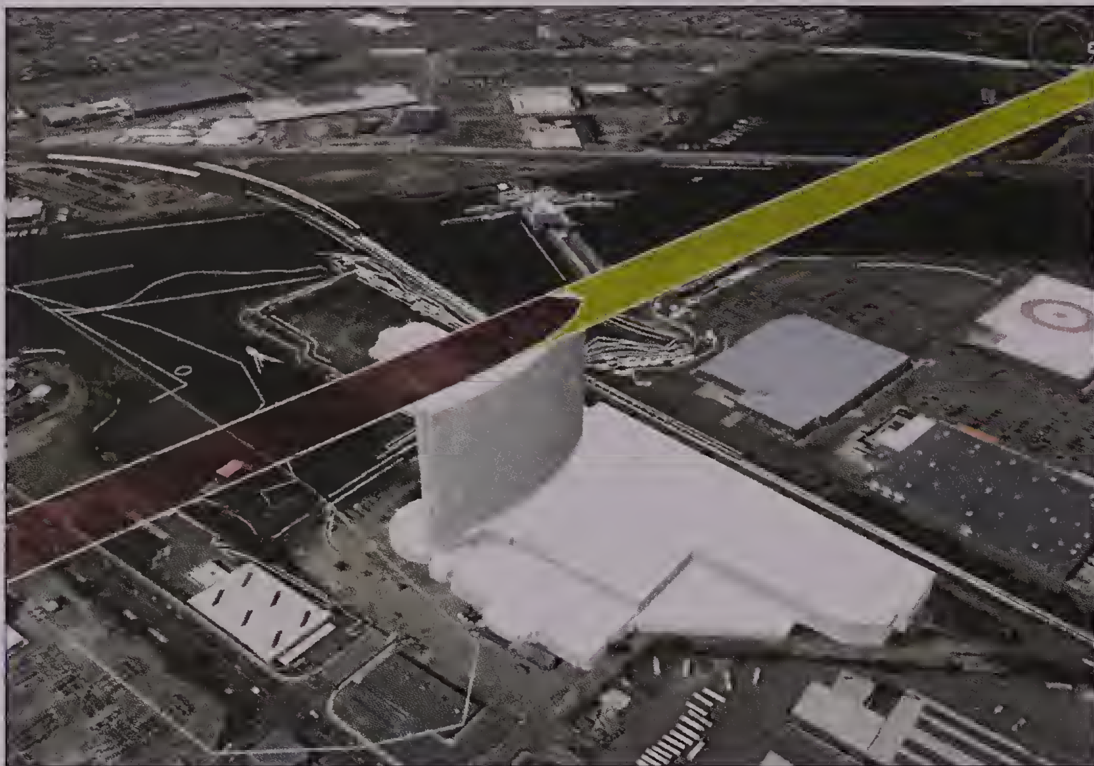


Figure 28: Standard Terminal Arrivals (STARS) GARDNER FOUR and QUABN FOUR intersect the Subject Building/ASR shielding plane at waypoint RSVOR.

Shown in Figure 28 are the routes aircraft are assigned for the STARS GARDNER FOUR and QUABN TWO from the west into the Boston Logan terminal area. Radar control is required for aircraft to be assigned these routes. Aircraft along this route require a minimum altitude of 5000 feet AMSL. This is a significantly greater altitude than the calculated shielding plane. No adverse impact to these STARS is expected from the FAA.



igure 29 depicts the generation of the shielding area created by the subject building. The area is based upon the highest building elevation. Shielding by existing object is not sufficient to shadow the subject building.

Figure 29: BOS Radar Shielded Area formed by subject building.

Graphical analysis of the shielding area with respect to actual aircraft flight tracks indicates departing fixed wing aircraft are at a greater altitude than the shielding plane. This is not true of helicopter traffic.

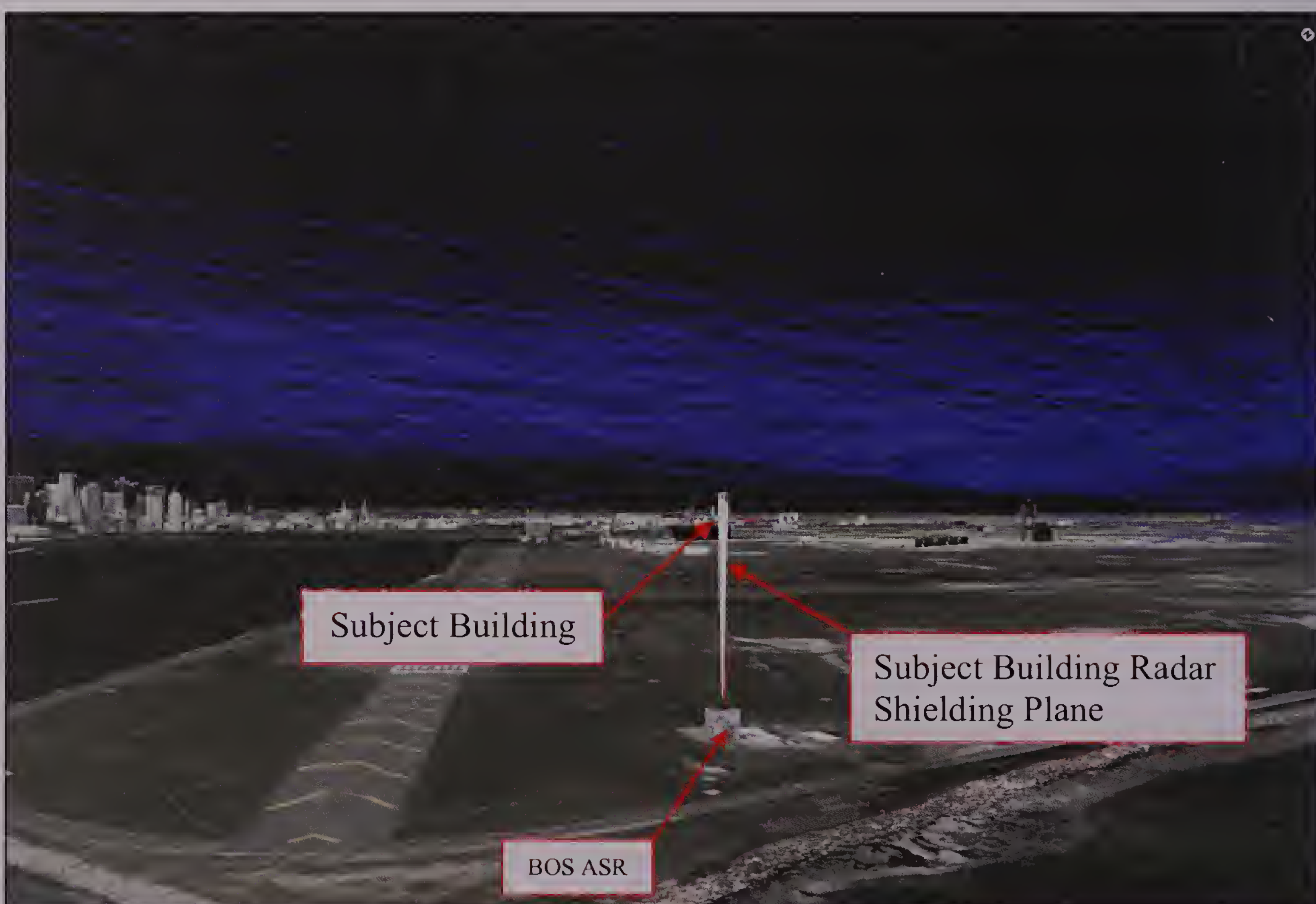


Figure 30: Radar Shielding Plane from Subject Building shown with flight tracks of departing aircraft.

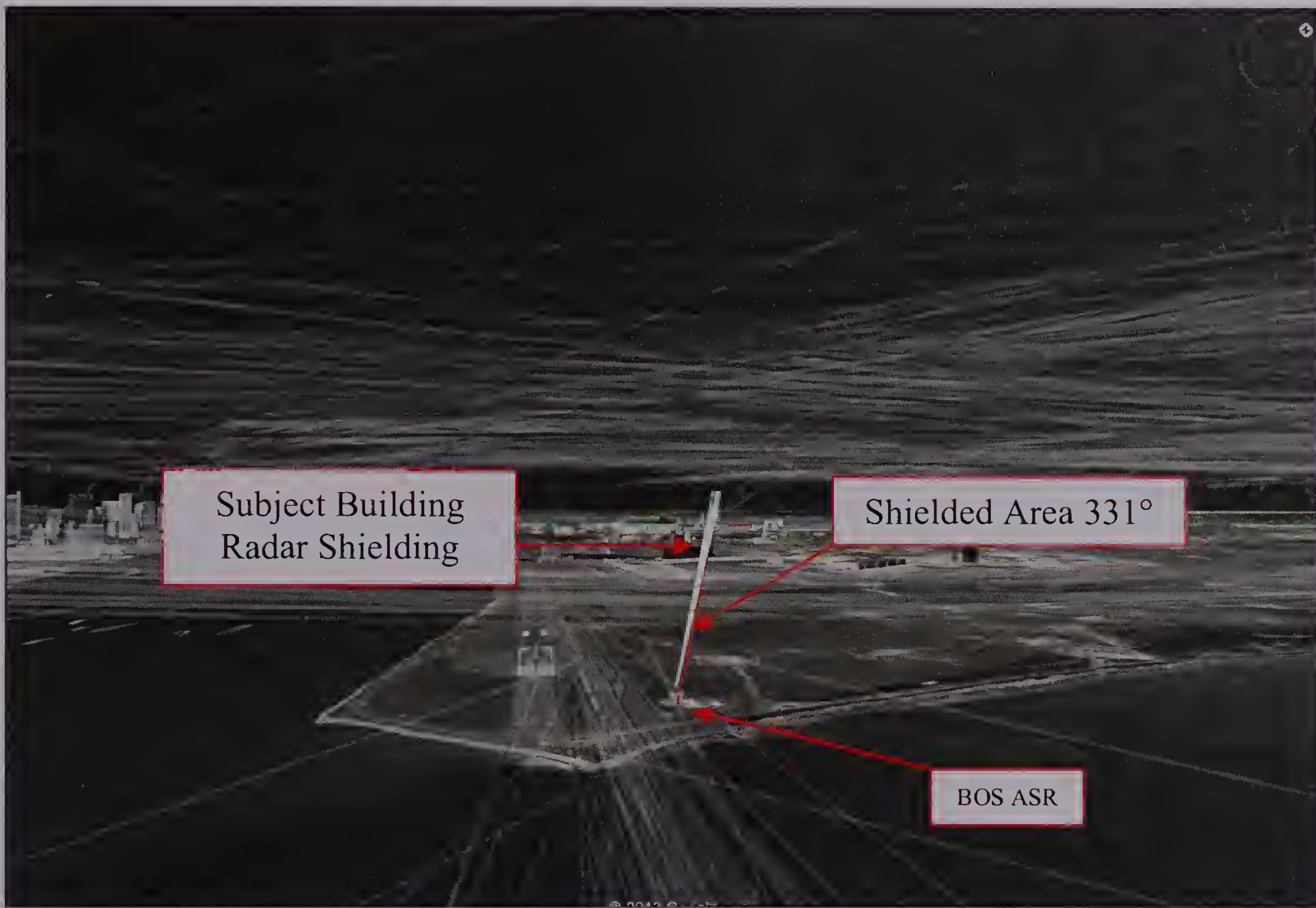


Figure 31: Radar Shielding Plane from Subject Building shown with flight tracks of arriving aircraft.

Figure 31 shows the extent of the potential findings by the FAA with regard to radar shielding of arrival aircraft. The shielding is in an area where minor shielding occurs. They may choose to invoke the "cumulative effect" to restrict development. They may ignore the potential shielding and reflection as the project is located within the confines of a major city.

Figure 32: Combined image of BOS MVA Chart, Class B Airspace and Subject building radar shielding.

Boston Logan International Airport is contained within Class B Airspace (Area A). This Airspace is controlled from the surface to 7000' AMSL. Superimposing Class B Area A with the Minimum Vectoring Altitude Chart with the subject building radar shielding area stipulates the minimum aircraft altitude out to 15 nautical miles is 1800' AMSL. The expected shielding altitude is below 1400' AMSL. This confirms the graphical analysis shown in Figure 27, 28 and 29. Please see Figure 17 for entire MVA Chart.

Figure 33: Helicopter Routes in Boston.

The nearest helicopter route in Boston is HAMPS-SPOND. This route is approximately 3770 feet from the subject building. At this distance there is no conflict with these routes. Inspection of the actual helicopter traffic from recorded flight tracts indicate helicopters have flown within close proximity of the subject building during the inspection period. At the closest point to the subject building the aircraft was at 439’ AMSL. Helicopter traffic can descend below 500’ AGL. In some instances Air Traffic may require helicopter assigned altitudes below 300’ AGL. However, all helicopter pilots must adhere to Title 14 CFR Part 91.119 and 135.203 during all flights (see and avoid).

Figure 34 BOS radar shielding of helicopter routes.

Inspection of the subject building shielding wedge and actual helicopter flight tracts will occur along HAMPS-SPOND route. From this point out to 15 nautical miles some shielding of helicopter traffic may occur within the narrow shielding width.

It will be necessary to wait until the FAA completes its initial Notice of Presumed Hazard to determine the necessary effort to overcome their findings with regard to radar shielding and false targets.

Military Operations Area (MOA) Screening

Figure 35: TERPS® Image: Predicted Impact of the proposed Wynn Everett Hotel/Casino development to nearby Military Operation Areas (MOA).

Figure 36: Predicted Impact of the proposed Wynn Everett Hotel/Casino development to nearby Military Operation Areas (MOA).

Figure 35 and Figure 36 depict a graphical representation of Military Operations Areas (MOA) located near the subject property boundary. The proposed development of the subject property is not expected to affect the MOA or Military Training Routes.

Conclusion

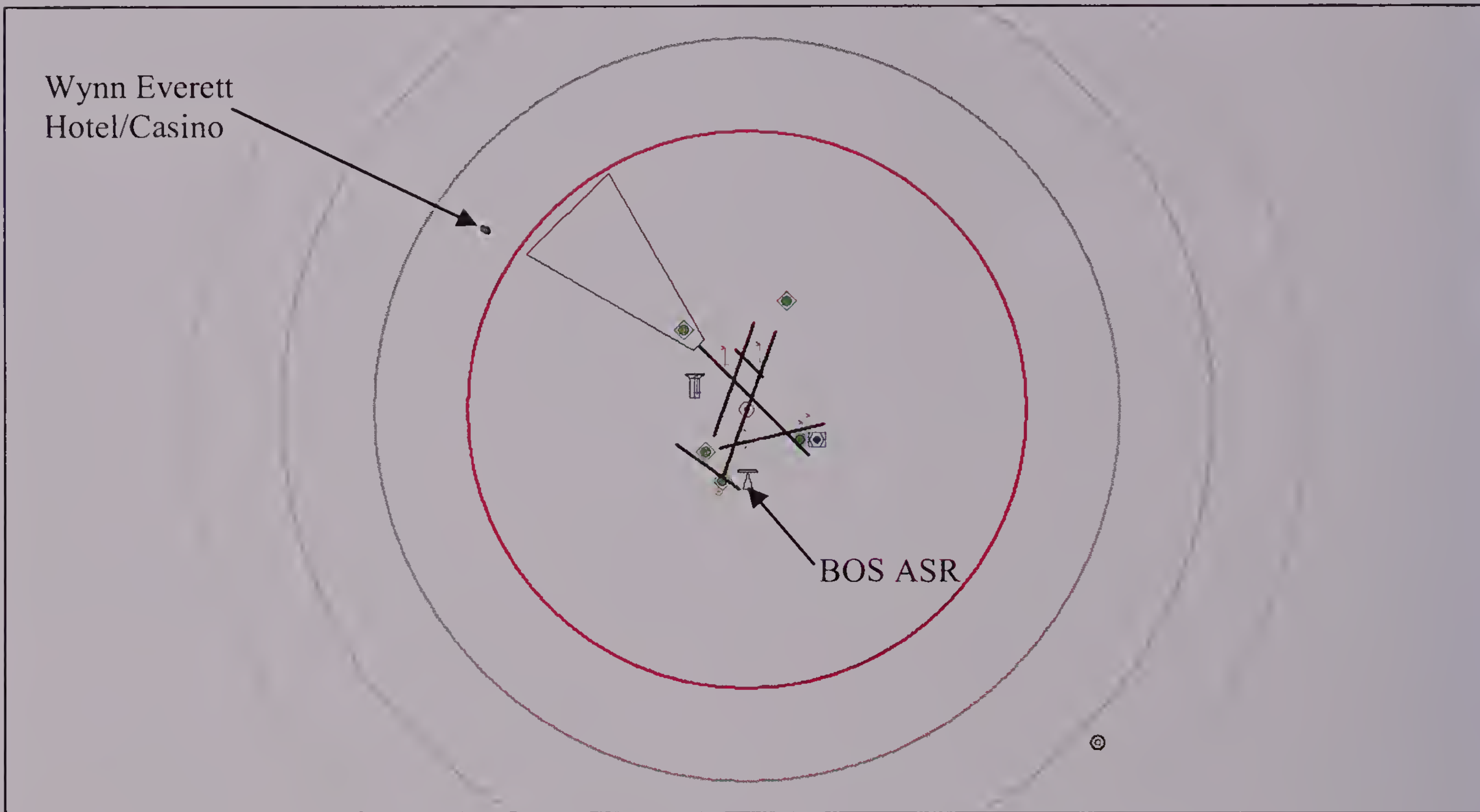


Figure 37: TERPS® image: Impacted Aeronautical Surfaces surrounding the Wynn Everett Hotel/Casino.

The aeronautical analysis of the Wynn Everett Hotel/Casino has determined that the most restrictive aeronautical surfaces are the BOS 77.17(a)(2) VFR Transitional Surface, the BOS Runway 33L Diverse A Departure, and the BOS Air Surveillance Radar (ASR). Obstruction marking and/or lighting the project in accordance with the FAA Advisory Circular 70/7460-1K is typically used as mitigation for penetrations to the 77.17(a)(2) VFR Transitional Surface. There are many existing structures which penetrate the VFR Transitional Surface.

The subject building is located within several IFR and departure procedures. Analysis of these procedures has determined none are penetrated. At 200 ft/NM the Runway 33L departure limits the closest point to 397 feet AMSL. The FAA may add restrictions with respect to additional equipment such as an antenna mounted to the building or solar panels.

The subject project has the potential to create false targets and shielding for the BOS ASR facility. The orientation of the building will redirect radar signal energy from the direction the radar antenna is pointing. Shielding will eliminate a small portion of the Class B, Area A Airspace assigned to the BOS terminal area. Based upon shielding calculations and actual flight track data fixed wing aircraft will not be obscured by the subject building. However, some helicopter traffic will be shielded along the HAMPS SPOND between VFR waypoint "VPHAM" and "SPY3". Only aircraft below 590 feet AMSL will be shielded. An aircraft traveling at a speed of 80 knots will be shielded from the radar signal for less than 2 seconds. The BOS ASR antenna rotation rate equates to the radar beam within the shielded area to 0.005 seconds/revolution. Considering the aircraft time to traverse the shielded area and the length of time the radar signal is within

the shielded area, it is highly unlikely Air Traffic will experience shielding of a single aircraft.

It will be necessary to wait until the FAA completes its initial Notice of Presumed Hazard to determine the necessary effort to overcome their findings.

Approved,

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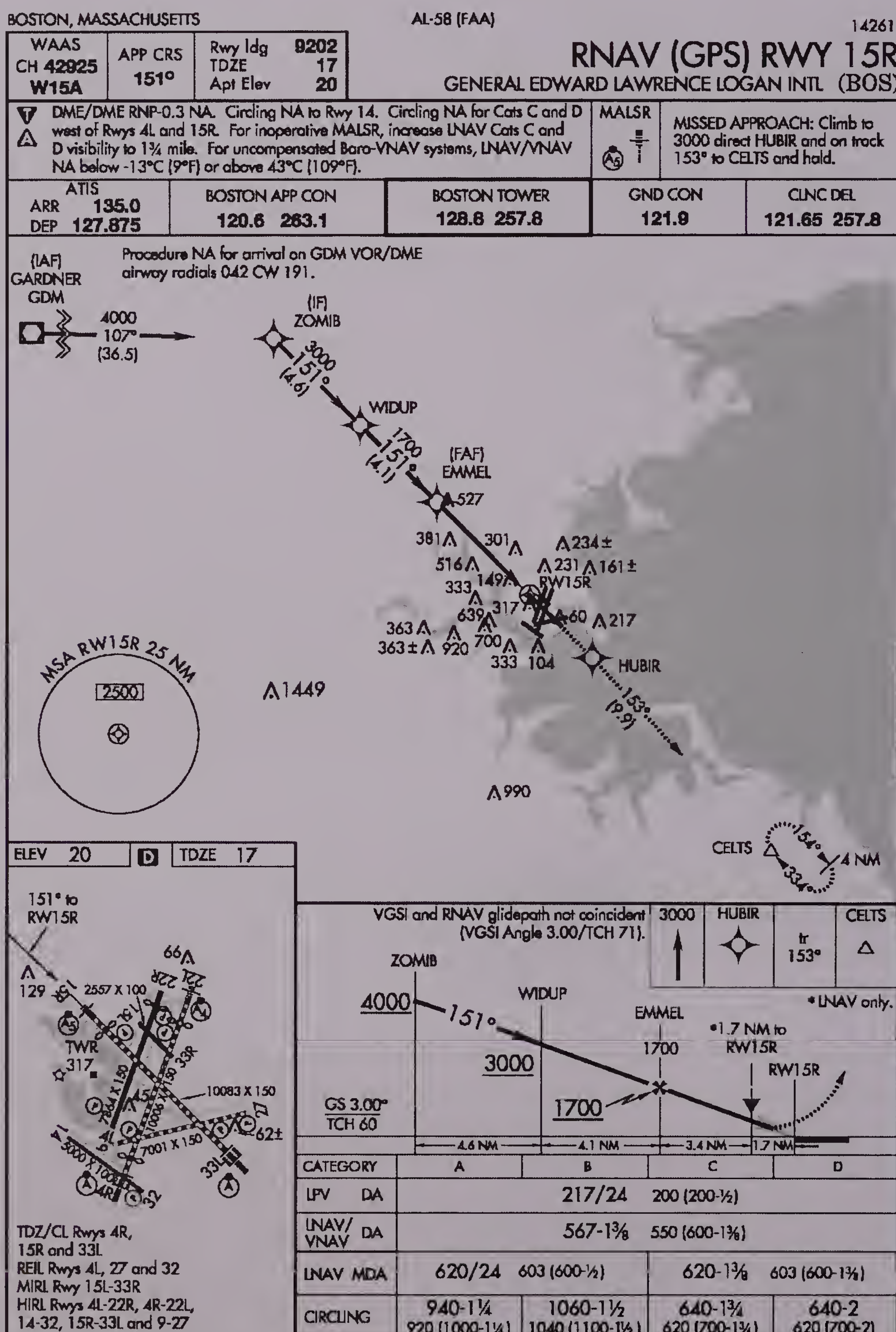
Clyde J. Pittman
Director of Engineering

Appendix A:

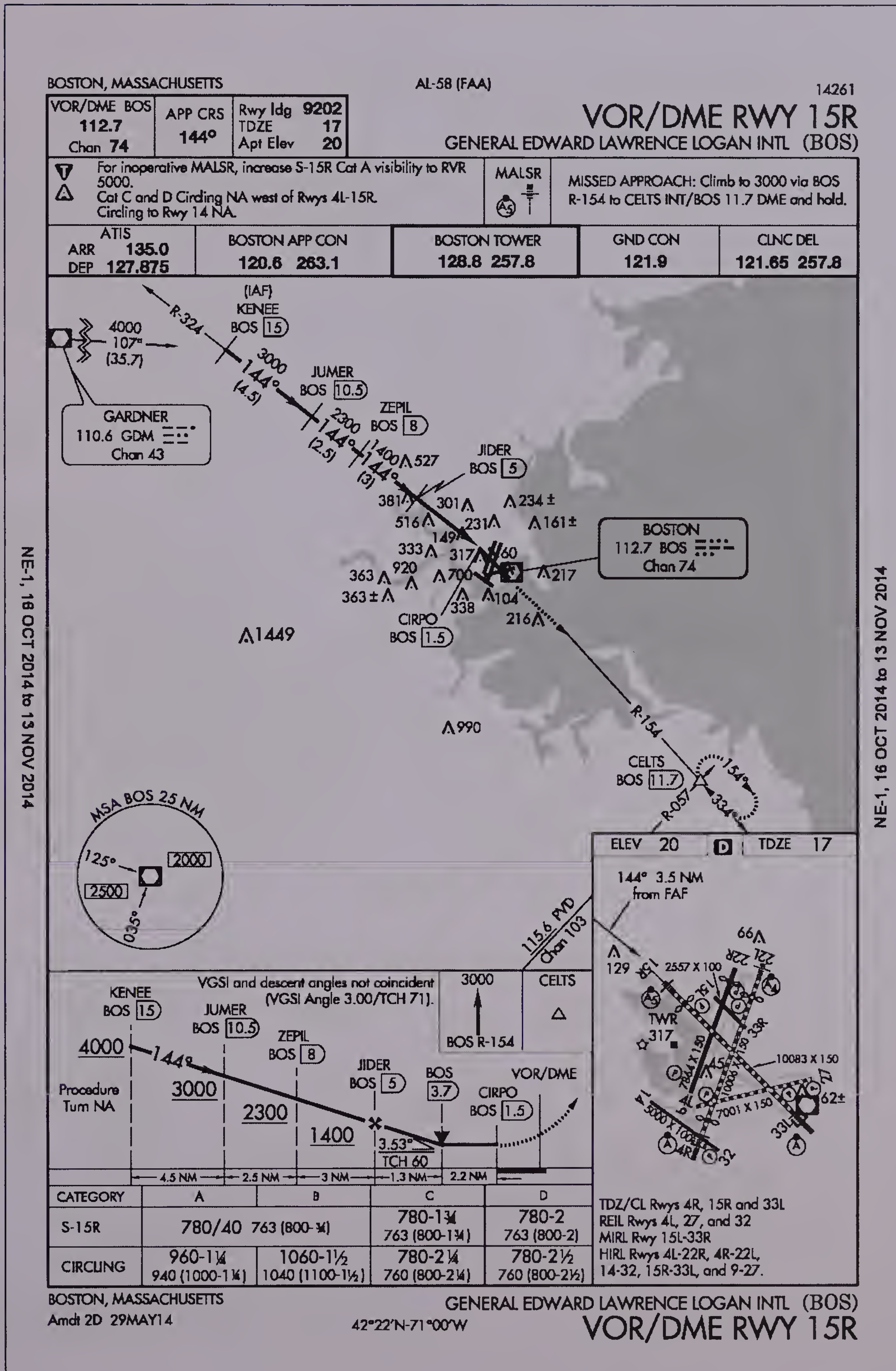
BOS RNAV (GPS) RWY 15R Approach Plate



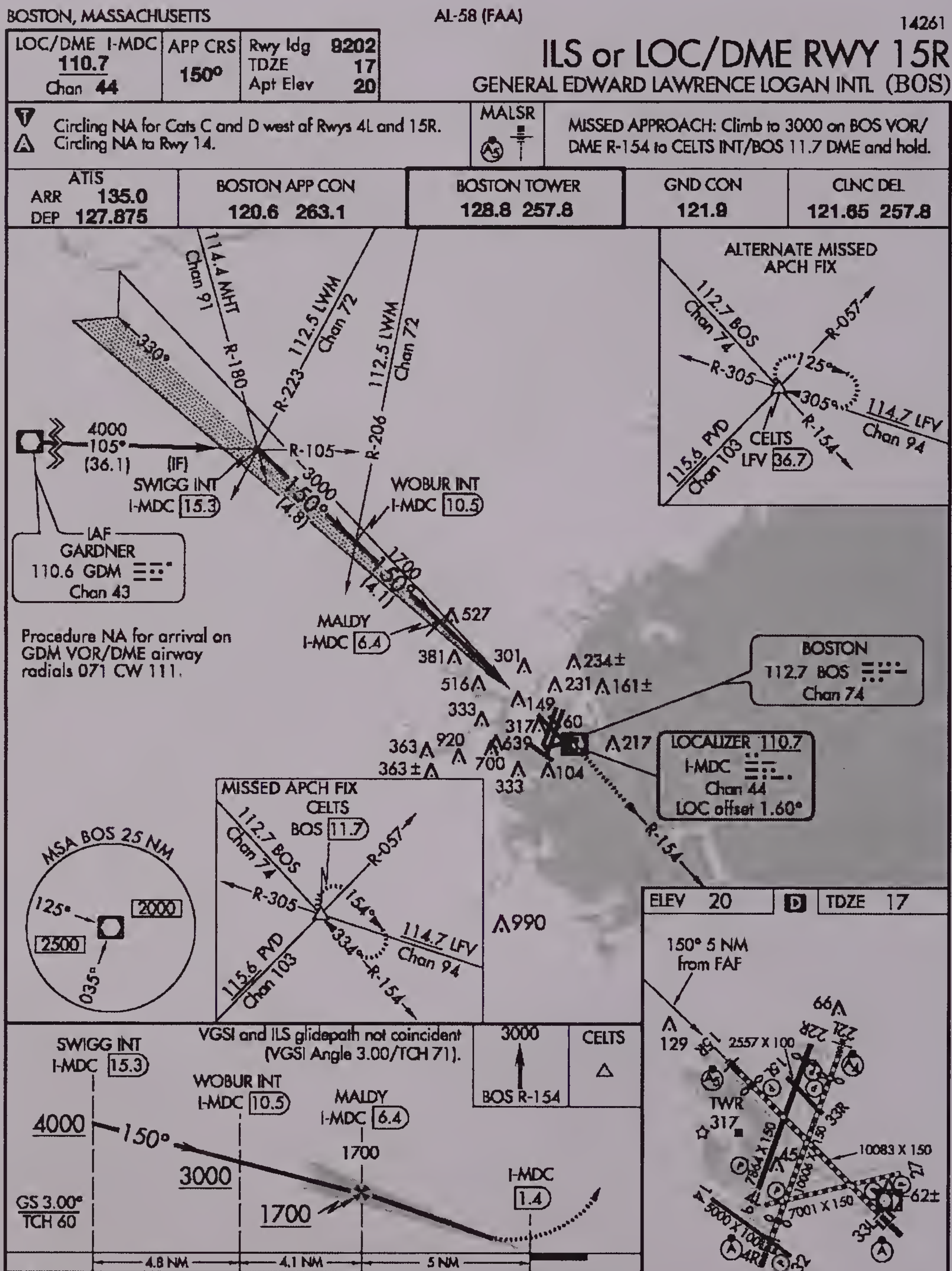
CATEGORY	A	B	C	D
LPV DA	217/24 200 (200-½)			
LNAV/VNAV DA	567-1⅜ 550 (600-1⅜)			
LNAV MDA	620/24 603 (600-½)		620-1⅜ 603 (600-1⅜)	
CIRCLING	940-1¼ 920 (1000-1¼)	1060-1½ 1040 (1100-1½)	640-1¾ 620 (700-1¾)	640-2 620 (700-2)

BOSTON, MASSACHUSETTS
Amdt 1B 29MAY14
GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
42°22′N-71°00′W
RNAV (GPS) RWY 15R

BOS VOR/DME RWY 15R Approach Plate



BOS ILS/LOC RWY 15R Approach Plate



CATEGORY	A	B	C	D
S-ILS 15R	267/24 250 (300-½)			
S-LOC 15R	600/24 583 (600-½)		600-1¼ 583 (600-1¼)	
CIRCLING	940-1¼ 920 (1000-1¼)	1060-1½ 1040 (1100-1½)	640-1¾ 620 (700-1¾)	640-2 620 (700-2)

BOSTON, MASSACHUSETTS
Amdt 1D 29MAY14
GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
42°22'N-71°00'W ILS or LOC/DME RWY 15R

NE-1, 16 OCT 2014 to 13 NOV 2014

Appendix B: Title 14 CFR Part 91

§91.119 Minimum safe altitudes: General.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface—

(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

Appendix C: Title 14 CFR Part 135

§135.203 VFR: Minimum altitudes.

Except when necessary for takeoff and landing, no person may operate under VFR—

(a) An airplane—

(1) During the day, below 500 feet above the surface or less than 500 feet horizontally from any obstacle; or

(2) At night, at an altitude less than 1,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown or, in designated mountainous terrain, less than 2,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown; or

(b) A helicopter over a congested area at an altitude less than 300 feet above the surface.

Appendix D: Building Corner Points

Point	Latitude	Longitude	AMSL	AGL	Total
1	42° 23' 40.68"	71° 04' 08.33"	10.3	343.5	353.8
2	42° 23' 41.06"	71° 04' 07.53"	10.3	343.5	353.8
3	42° 23' 43.41"	71° 04' 12.19"	10.3	386	396.3
4	42° 23' 42.71"	71° 04' 12.26"	10.3	386	396.3

Table 1: Proposed building coordinate points and height parameters

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Federal Airways & Airspace®

Aeronautical Impact Statement

Document No.: 2013-AIS-1029-OE, Rev 2
Site: Wynn Everett Hotel/Casino

Prepared for: Fort Point Associates, Inc.
Date: 11 November 2014

This **Aeronautical Impact Statement** (AIS) was prepared by Federal Airways & Airspace (FA&A) for Fort Point Associates, Inc. on 11 November 2014.

2013-AIS-1029-OE identifies all potential aeronautical impacts that could result from the development of a property consisting of a hotel/casino approximately 382' AMSL to 402' AMSL.

Notice and Obstruction Criteria established by Title 14 CFR Part 77, *Safe, Efficient Use of the Navigable Airspace* were applied[1].

This Aeronautical Impact Statement provides a baseline study establishing the relationship between the National Airspace System (NAS) [2] and the Transmission.

Changes to tower height and configuration, coordinates, and the aeronautical environment will warrant a Revision to Document 2013-AIS-1029-OE.

The National Airspace System (NAS) is a dynamic and intricate network of invisible aeronautical surfaces, navigational facilities and landing facilities and is subject to constant revision. Aeronautical datasets are updated regularly at 28 and 56 day intervals. At a minimum, all Aeronautical Impact Statements should be updated annually. The aeronautical environment is subject to change at any given time as the direct result of new data regarding existing structures and structures for which FAA Form 7460-2, *Notice of Actual Construction or Alteration*, have been filed. Alterations to the aeronautical environment cannot be anticipated. It is recommended that 2013-AIS-1029-OE be reviewed and a revision published prior to filing FAA Form 7460-1 if more than 56 days elapse between the date of this report and the date that these forms are submitted to the FAA.

The Background Summary of the Final Rule for Title 14 CFR Part 77 states that the FAA is now applying an expanded range of Notice Criteria, and that the FAA web site https://oeaaa.faa.gov must be consulted to determine notice requirements for structures near all airports listed on the web site. Because the web site performs its calculations using the FAA's Digital Obstacle File (DOF) and OE/AAA Automated System Airport Runway Database, both of which are documented to contain errors and omissions, it is not advisable to consult the FAA website to determine notice requirements. This AIS was compiled using FA&A's Airspace and TERPS software, which are supported by independent, proprietary obstacle and airport/runway databases in addition to FAA administrated airport/runway data.

This revision (2) was mandated because of designe changes to the subject building. The changes were the shape and height of the subject building.

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[1] Title 14 Code of Federal Regulations Federal Aviation Regulation Part 77, *Safe, Efficient Use of the Navigable Airspace*, was published in the Federal Register on 21 July 2010 and became effective 18 January 2011.
[1] Aeronautical Data updates are published every 56 days.

TABLE OF CONTENTS

Parameters and Assumptions

The defined subject building, located in Boston, MA, will be analyzed to determine if a 382’ AMSL to 402’ AMSL hotel/casino would create an adverse impact to air navigation.

<u>Project Statistics</u>

There are 3 public-use and 31 private-use airports within approximately 15 Nautical Miles of the subject property. Additionally, there are 31 public-use Instrument Approach Procedures currently in use within the surrounding area that will require analysis.

<u>Aeronautical Impact Analysis</u>

The following will be reviewed for the public-use airport:

- Federal Notice Criteria limits over property
- Obstacle Criteria height limits over property
- Near airport surfaces
- VFR Traffic Pattern limits
- TERPS/Instrument Approach Procedures

En Route Airways, Minimum Safe Altitude (MSA) and Minimum Vector Altitude (MVA) will also be assessed.

Each private-use airport will be investigated for special/private instrument procedures that are protected by the FAA and would impose height restrictions upon the subject property.

Lastly, impact of the proposed development of the subject property to NEXRAD Weather Radar, Air Route Surveillance Radar (ARSR), Airport Surveillance Radar (ASR), Military Operations Areas (MOA) and potential impacts to other air navigation facilities will be reviewed.

Aeronautical Environment

The Wynn Everett Hotel/Casino was analyzed for the potential placement of a 382' AMSL to 402' AMSL building. Notice to the Federal Aviation Administration (FAA) is required for all of the points per Title 14 CFR Part 77. 9(a) and 77.9(b) because they are over 200' AGL and penetrate the notice slope for the General Edward Lawrence Logan International Airport (BOS).

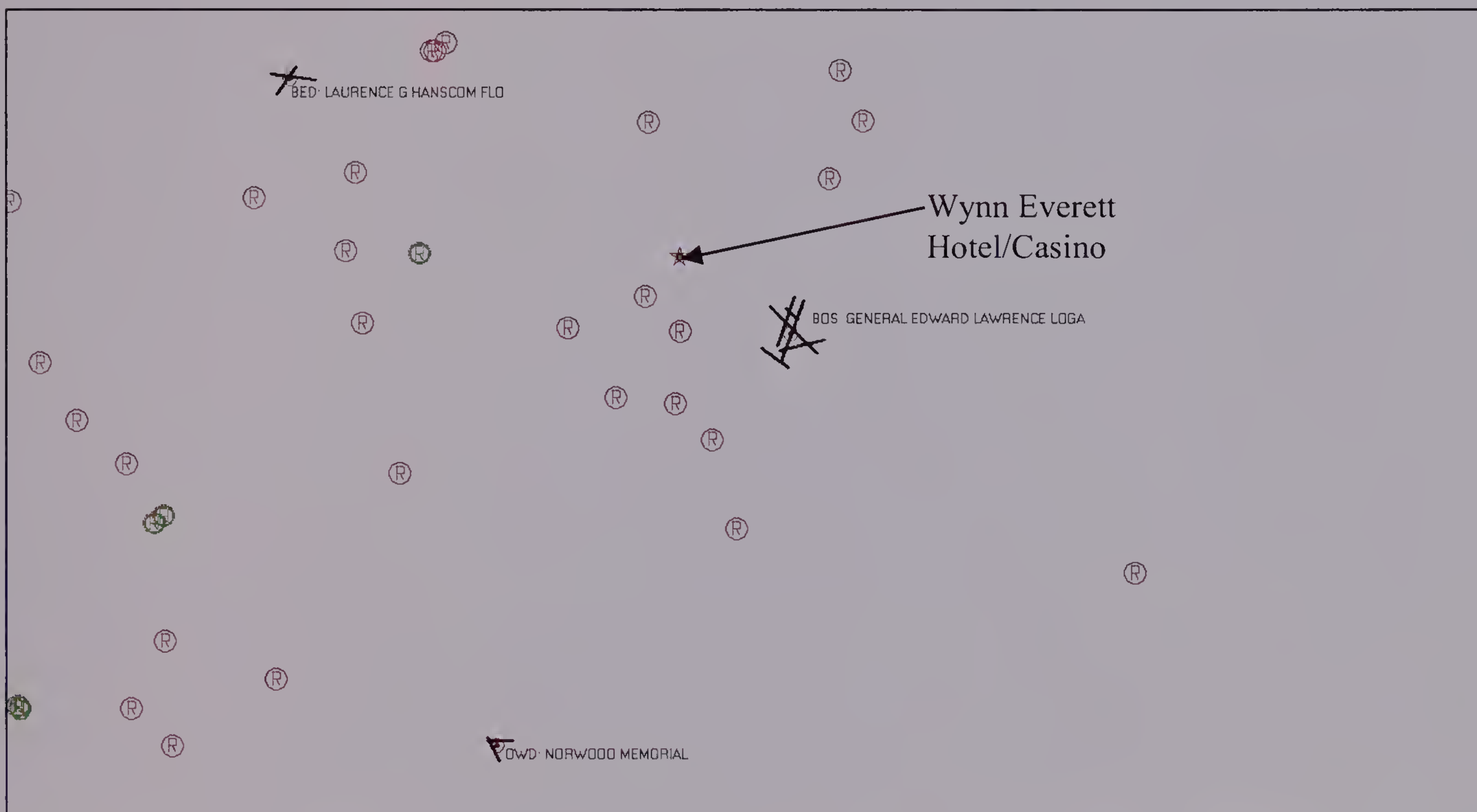


Figure 1: TERPS® image: Wynn Everett Hotel/Casino Area and Surrounding Airports

There are 31 Private Landing Facilities located within 15 NM of the Wynn Everett Hotel/Casino. None of these Private Landing Facilities have any Special Procedures associated with them as of the date of publication of this document. The proposed development of the Wynn Everett Hotel/Casino should not be affected by these facilities.

MGL Chapter 90, Section 35B

Massachusetts General Law Chapter 90, Section 35B prevents construction of any structure above 150 feet above the runway within a rectangle area lying 1500 feet either side of the extended centerline of a runway or landing strip of an airport approved by the commission for a distance of two miles from the end of the runway. The Wynn Project is 2.856 miles along-track distance from the nearest runway at BOS. Therefore, the Wynn Project is not subject to the requirements of this law. Notice to the Massachusetts Aeronautics Commission (MAC) Form E-10 will need to be completed and submitted to the commission for Airspace Analysis.

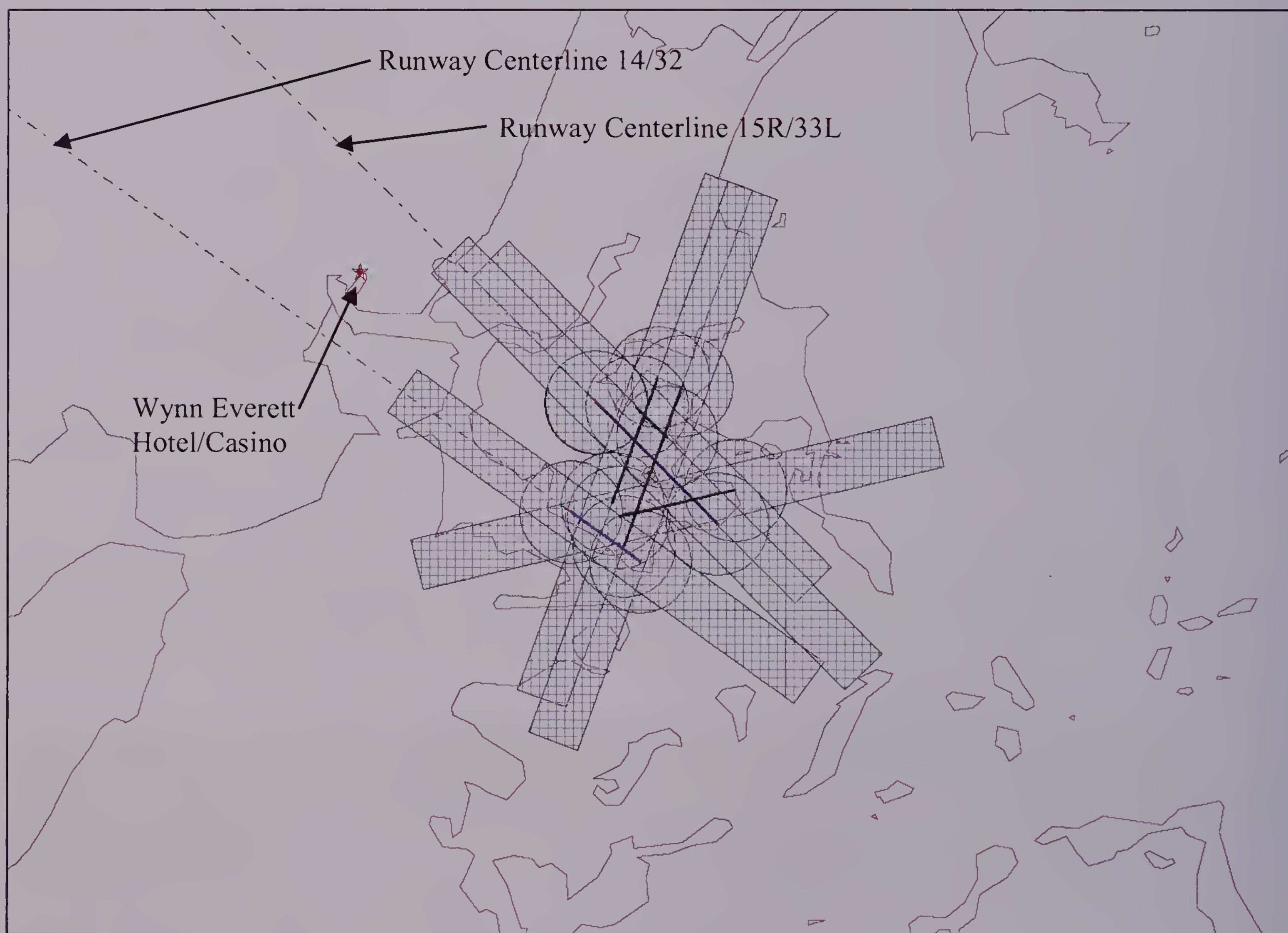


Figure 2 Massachusetts General Law Chapter 90, Section 35B

Obstruction Clearance Surface as defined for Boston Logan International Airport is shown in Figure 1. The subject project in not located within and MGL aviation surfaces.

Appendix F

Pedestrian Wind Assessment

novus
ENVIRONMENTAL
150 Research Lane, Suite 105
Guelph, ON, N1G 4T2
226.706.8080 | www.novusenv.com

Date: November 5, 2014

To: Fort Point Associates, Inc.
33 Union St, 3rd Floor
Boston, Massachusetts 02108

Re: **Pedestrian Wind Assessment**
Wynn Everett Resort & Casino
Everett, MA
Novus Project # 13-0037

Novus Team:

Specialist, Microclimate:	Tahrana Lovlin, MAES, P.Eng.
Senior Specialist, Microclimate:	Bill F. Waechter, C.E.T.

1.0 INTRODUCTION

Novus Environmental Inc. (Novus) was retained by Fort Point Associates, Inc. to conduct a pedestrian wind assessment for the proposed Wynn Everett resort and casino development located in Everett, Massachusetts. The objective of this assessment was to determine the wind comfort on the site and provide, where necessary, recommendations for mitigative measures. This report addresses design updates of the project that occurred subsequent to submission of the Draft Environmental Impact Report (DEIR).

1.1 Existing Development

The site is located on vacant land in Everett, Massachusetts. The site is encompassed by Broadway to the east, the Mystic River and tidal flats to the south, a commuter rail line to the west and Horizon Way to the north (**Figure 1**). The site is located in an area of mixed-use, which includes industrial, commercial and retail buildings, with low-rise residential buildings to the northeast.

1.2 Proposed Development

The proposed development includes a large podium, with a 25-storey (approximately 340 ft) tall tower on the south edge of the podium. The proposed Wynn Everett development includes a resort and casino, as well as commercial and retail facilities.

1.3 Areas of Interest

Areas of interest for pedestrian wind conditions include those areas which pedestrians are expected to use on a frequent basis. For this development, these include sidewalks, entrances, an amphitheater, a gazebo, the river walk, docks, and transit stops (**Figure 2**).

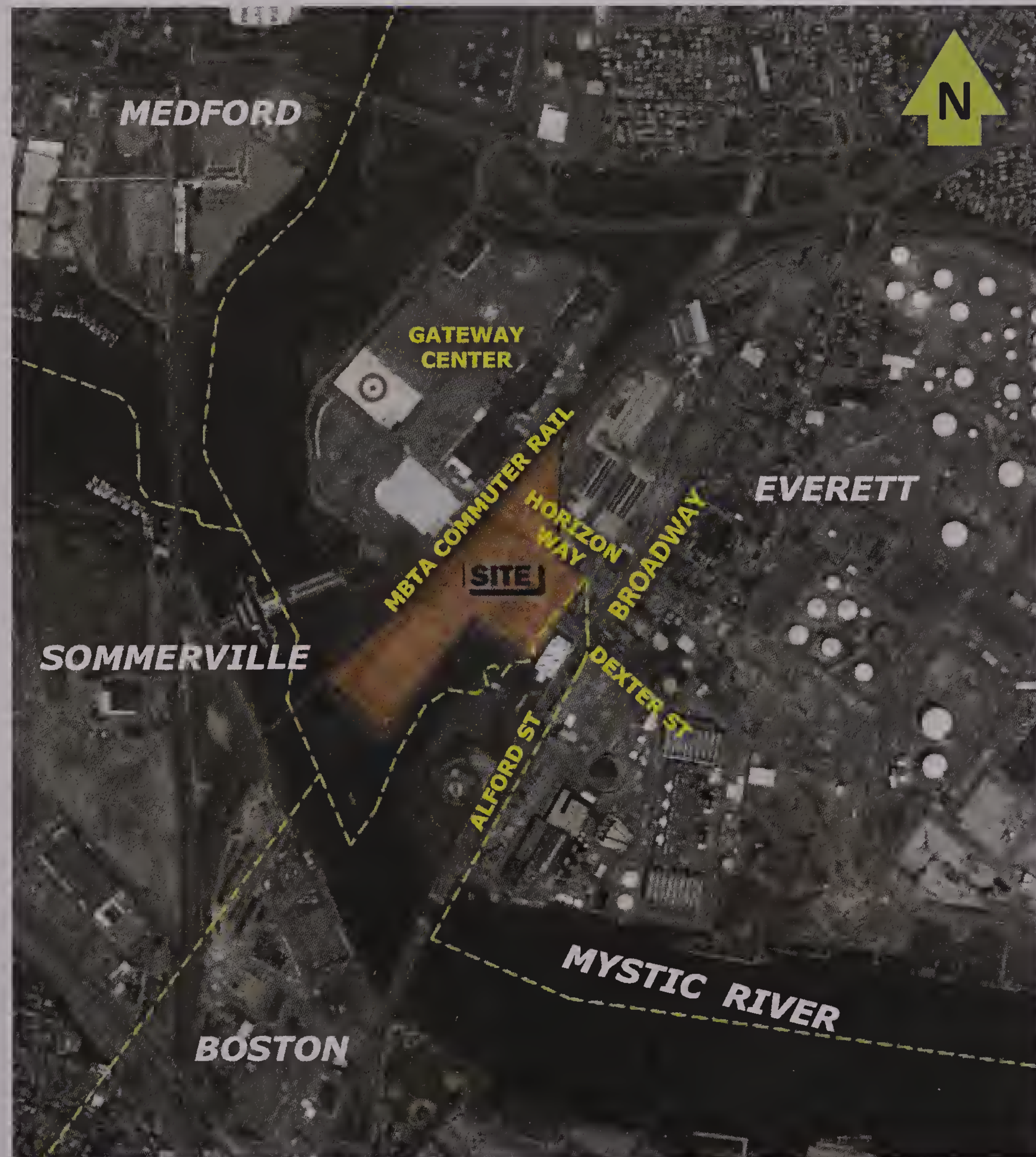


Figure 1: Context Plan
Credit: Vanasse & Associates, Inc.

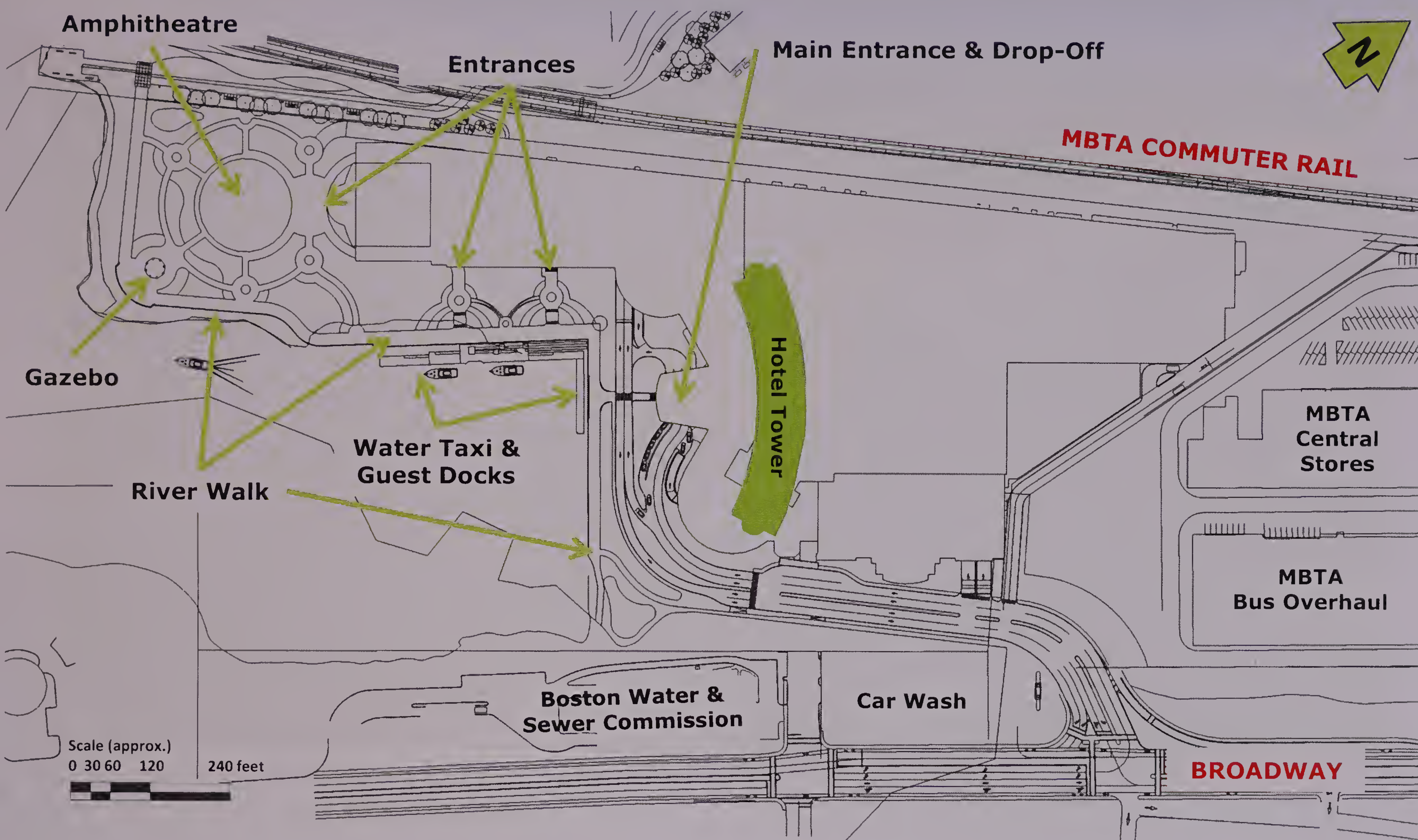


Figure 2: Areas of Interest

2.0 APPROACH

A screening-level assessment was conducted using computational fluid dynamics (CFD). As with any simulation, there are some limitations with this modeling technique, specifically in the ability to simulate the turbulence, or gustiness, of the wind. Nonetheless, CFD analysis remains a useful tool to identify potential wind issues. This CFD-based wind assessment employs a comparable analysis methodology to that used in wind tunnel testing. The results of CFD modelling are an excellent means of readily identifying relative changes in wind conditions associated with different site configurations or with alternative built forms.

2.1 Methodology

Wind comfort conditions for areas of interest were predicted on and around the development site to identify potentially problematic windy areas. A 3-D model of the development was provided by Fort Point Associates, Inc. on October 31, 2014. A view of the 3-D model used in the computer wind comfort analysis is shown in **Figure 3**. This model included surrounding buildings within approximately 2700 ft from the study site, with additional buildings across the river included. The simulations were performed using CFD software by Metodyn Inc.

The entire 3-D space throughout the modeled area is filled with a three-dimensional grid. The CFD virtual wind tunnel calculates wind speed at each one of the 3-D grid points. The upstream "roughness" for each test direction is adjusted to reflect the various upwind conditions and wind characteristics encountered around the actual site. Wind speeds for a total of 16 compass directions were assessed. Although wind speeds are calculated throughout the entire modeled area, wind comfort conditions were plotted for a smaller area within approximately one block of the development site to reduce computational run time.

The CFD-predicted wind speeds for all test directions and grid points were then combined with historical wind climate data for the region to predict the occurrence of wind speeds in the pedestrian realm, and to compare against wind criteria for comfort and safety; these results are shown in the various wind flow images. The analysis of wind conditions was undertaken for the seasonal extremes of summer and winter.

Results are presented through discussion of the wind conditions along major streets and the areas of interest. The comfort criteria are based on predictions of localized wind forces combined with frequency of occurrence. Climate issues that influence a person's overall "thermal" comfort, (e.g., temperature, humidity, wind chill, exposure to sun or shade, etc.) are not considered in the comfort rating.

Figure 3: 3-D Massing Model

2.2 Wind Climate

Wind data recorded at the Boston Logan International Airport for the period of 1981 to 2011 were obtained and analysed to create a wind climate model for the seasonal extremes. Annual and seasonal wind distribution diagrams ("wind roses") are shown in **Figure 4**. These diagrams illustrate the percentage of time wind blows from the 16 main compass directions. Of main interest are the longest peaks that identify the most frequently occurring wind directions. The annual wind rose indicates that wind approaching from the northwesterly and south westerly directions are most prevalent. The seasonal wind roses readily show how the prevalent winds shift throughout the year.

The directions from which stronger winds (e.g., > 18.6 mph) approach are also of interest as they have the highest potential of creating problematic wind conditions, depending upon site exposure and the building configurations. The wind roses in **Figure 4** also identify the directional frequency of these stronger winds, as indicated in the figure's legend colour key. On an annual basis, strong winds occur from the northwesterly and westerly sectors. All wind speeds and directions were included in the wind climate model.

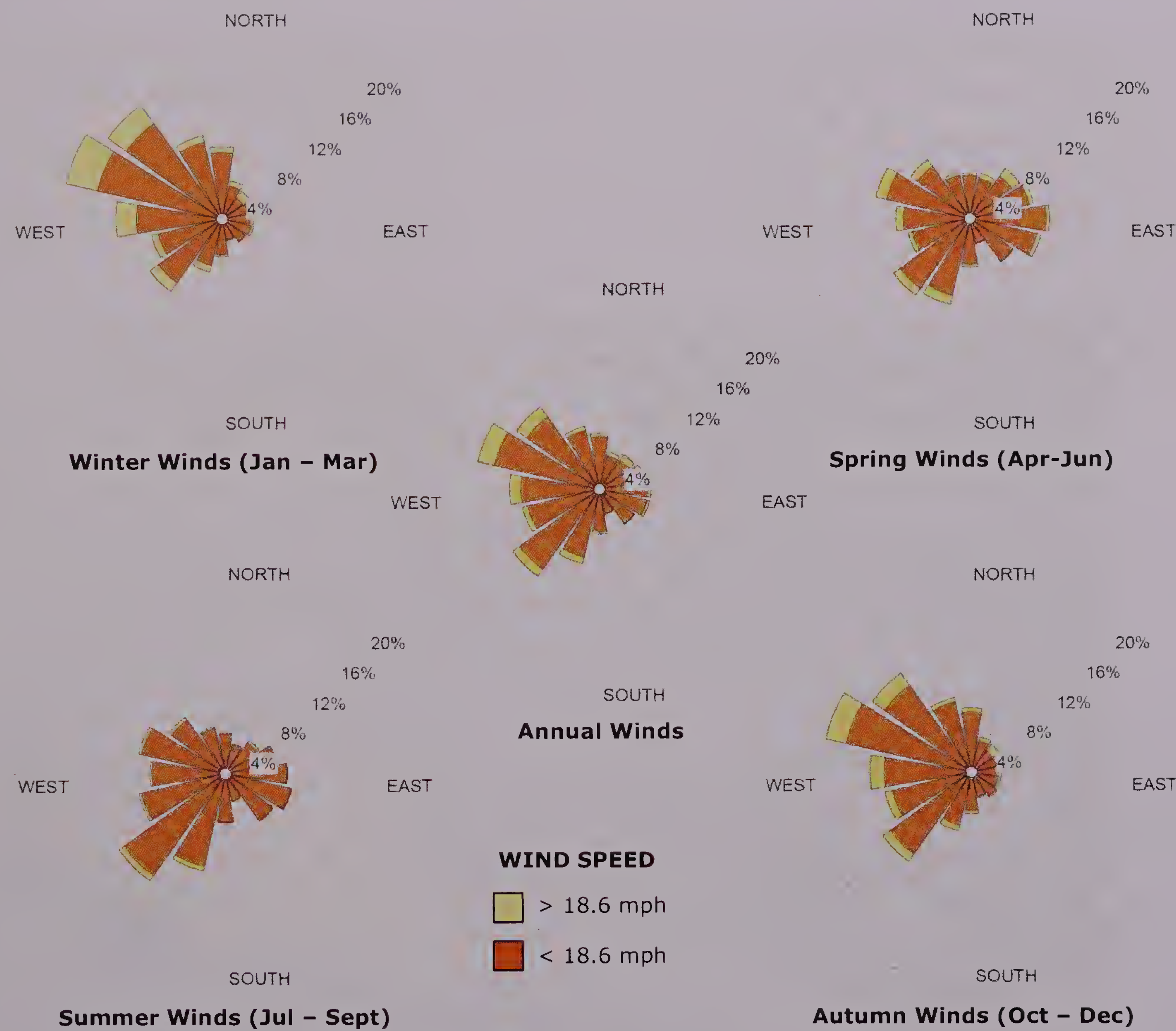


Figure 4: Wind Roses for Boston Logan Airport (1981 – 2011)

3.0 PEDESTRIAN WIND CRITERIA

Wind comfort conditions are discussed in terms of being acceptable for certain pedestrian activities and are based on predicted wind force and the expected frequency of occurrence. Wind chill, clothing, humidity and exposure to direct sun, for example, all affect a person's thermal comfort; however, these influences are not considered in the wind comfort criteria.

The comfort criteria, which are based on certain predicted hourly mean wind speeds being exceeded 5% of the time, are summarized in **Table 1**. Very roughly, this is equivalent to a wind event of several hours duration occurring about once per week.

The criterion for wind safety in the table is based on hourly mean wind speeds that are exceeded 0.1% of the time (approximately nine hours per year). When more than three, 3-hour events (nine hours a year) are predicted to exceed the Fair-Weather Area criterion on an annual basis, wind mitigation measures are then advised, especially for frequently accessed areas. The wind safety criterion is shown in **Table 2**.

The criteria for wind comfort and safety used in this assessment are based on those developed at the Boundary Layer Wind Tunnel Lab of the University of Western Ontario, together with building officials in London England. They are based broadly on the Beaufort scale and on previous criteria that were originally developed by Davenport. The criteria are used by the Alan G. Davenport Wind Engineering Group Boundary-Layer Wind Tunnel Laboratory for pedestrian wind study projects located around the globe.

Table 1: Wind Comfort Criteria

Activity	Comfort Ranges for Mean Wind Speed Exceeded 5% of the Time		Description of Wind Effects
Sitting	0 to 9 mph	0 to 4 m/s	• Light wind felt on face • Leaves rustle
Standing	0 to 13 mph	0 to 6 m/s	• Hair is disturbed, clothing flaps • Light leaves and twigs in motion • Wind extends lightweight flag
Leisurely Walking	0 to 18 mph	0 to 8 m/s	• Moderate, raises dust, loose paper • Hair disarranged • Small branches move
Fast Walking	0 to 22 mph	0 to 10 m/s	• Force of wind felt on body • Trees in leaf begin to move • Limit of agreeable wind on land
Uncomfortable	> 22 mph	> 10 m/s	• Small trees sway • Umbrella use becomes difficult

Table 2: Wind Safety Criterion

Activity	Safety Criterion Mean Wind Speed Exceeded 3 Times per Year (3x3hr)		Description of Wind Effects
Any [1]	45 mph	20 m/s	• Difficult to walk straight • Wind noise on ears unpleasant

[1] Equivalent to the "Fair Weather Location" criterion of UWO's Criteria, which applies to frequently accessed areas.

4.0 RESULTS

Figures 5a and **5b** presents graphical images of the wind comfort conditions for the summer and winter months around the proposed development. The "comfort zones" shown are based on an integration of wind speed and frequency for all 16 wind directions tested with the seasonal wind climate model. The assessment does not account for the presence of mature trees, thus wind comfort conditions for months when foliage is present could be better than those predicted.

Wind conditions suitable for leisurely walking are preferred along sidewalks during the summer and winter months, but can be difficult to achieve in the winter. At the main entrances and transit stops, winds rated suitable for standing are preferred on a year-round basis. Wind comfort levels of sitting and standing are preferred in outdoor amenity spaces where seating is present.

4.1 Proposed Development – Grade

For entrances and drop-off areas, winds comfortable for standing are preferred throughout the year. At the amphitheater and gazebo, calmer wind conditions, suitable for sitting and standing, respectively, would be desirable during seasons where frequent usage is expected. Along the river walk, wind conditions comfortable for leisurely walking would be ideal, while at the docks, wind conditions comfortable for standing would be preferred throughout the year.

Figure 5a (next page) illustrates the wind comfort conditions in the summer time. This shows that wind conditions comfortable for standing or sitting were evident on most of the site, which is appropriate for the intended usage of most areas. As calmer wind conditions are preferred at the amphitheater (Location A), we suggest including dense landscaping around the perimeter to shelter the area from the prevailing southwesterly winds in the summer. However, there is also the possibility that patrons would welcome cooling sea breezes on hotter days. Portable wind screens, used in conjunction with dense landscaping, should be considered to allow for a flexible approach to wind and thermal comfort. Along the river walk, wind conditions are appropriate for the intended usage, but there may be a desire to incorporate some sheltered areas along the path for the occasional periods of stronger winds.

During the winter season (**Figure 5b**), wind conditions around the site were generally suitable for leisurely walking or standing. At the southeast corner of the development (Location B), wind conditions were comfortable for fast walking, due to the acceleration of westerly winds around the tower. Wind conditions were considered suitable for the intended usage of the various areas; no mitigation is required.

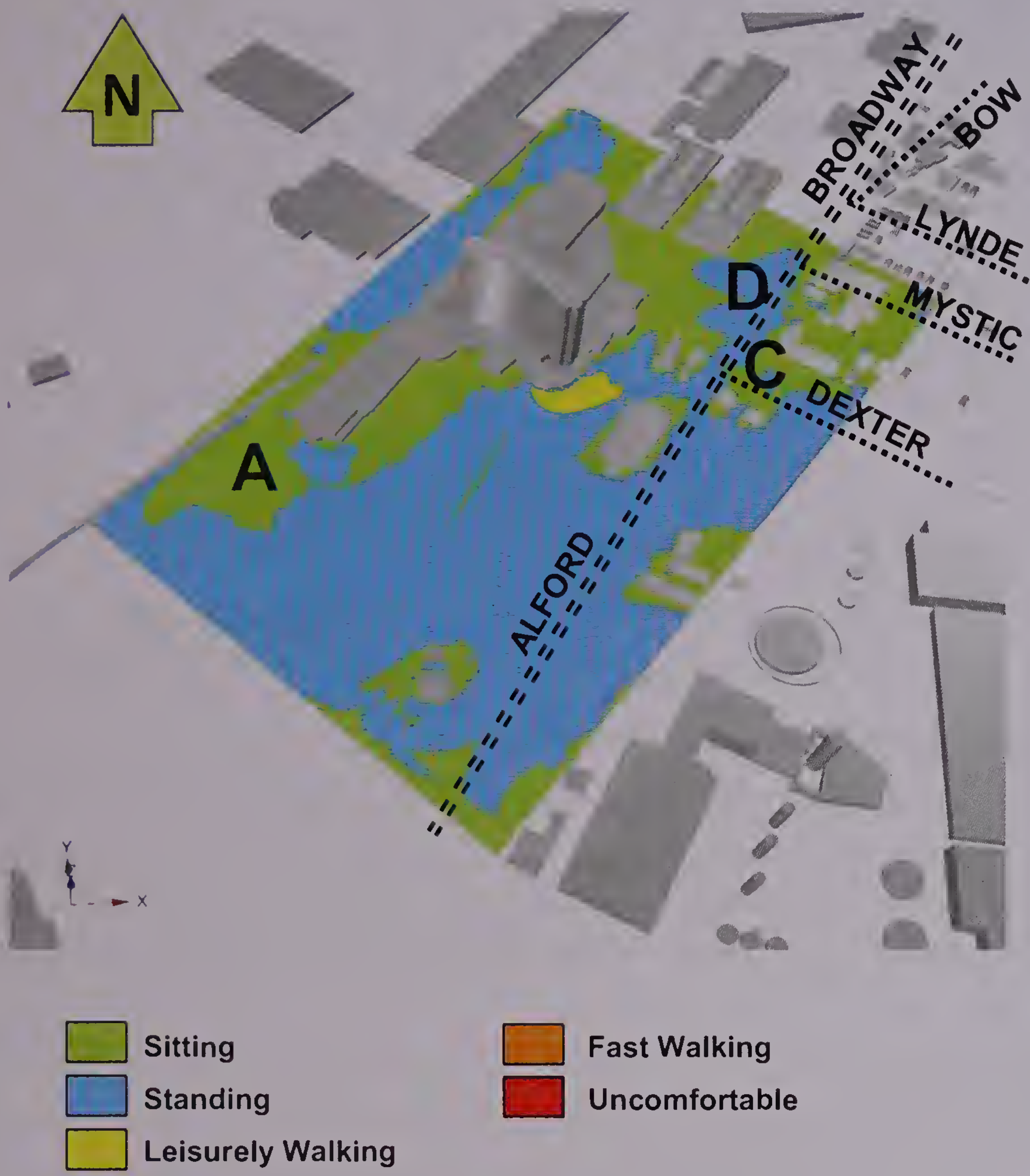


Figure 5a: Wind Comfort at Grade – Proposed Configuration Summer Season

Figure 5b: Wind Comfort at Grade – Proposed Configuration Winter Season

4.2 Nearby Streets

On sidewalks, wind conditions should be suitable for fast walking or better throughout the year; for transit stops, wind conditions should be comfortable for standing throughout the year. As shown in **Figures 5a** and **5b** wind conditions along Alford Street and Broadway were comfortable for leisurely walking or better during both the summer and winter seasons. The large setback of the hotel tower from Alford Street and Broadway, plus the tower's orientation relative to the prevailing west-northwesterly winds results in a minimal influence on wind conditions within the public realm.

There are currently two transit stops nearby. One at Broadway and Dexter Street (Location C in **Figure 5a**), another at Broadway and Horizon Way (Location D). In both the summer and winter seasons, wind conditions at these two transit stops were comfortable for sitting or standing.

The wind conditions on the nearby streets are considered suitable for the intended usage.

4.3 Wind Safety

The wind safety criterion was met on and around the proposed Wynn Everett resort and casino development.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The wind comfort conditions on and around the proposed Wynn Everett resort and casino have been assessed through computer modelling techniques (CFD). Based on the results of our assessment, the following conclusions and recommendations have been reached:

- Summer and winter wind comfort conditions on and around the proposed development were generally suitable for the intended usage.
- In the amphitheater, during the summer, winds were slightly stronger than desired; these cooling breezes may be welcomed by patrons during the hotter days of the summer season. As a precaution for stronger wind event days, dense landscaping and portable wind screens should be considered for the area, in order to provide the desirable wind and thermal comfort conditions.
- The wind safety criterion was met in all areas both on and off-site.
- The thermal comfort of pedestrians has not been considered in this study. However, as wind speeds are relatively low in the areas of interest, the inclusion of shade through trees, trellis/canopies, arbors, etc. would be welcome on hot and sunny summer days. These would be most desirable where people must wait outside (e.g., water taxi).

6.0 ASSESSMENT APPLICABILITY

This assessment is based on computer modeling techniques and provides a qualitative overview of the pedestrian wind comfort conditions on and surrounding the proposed development site. Any subsequent alterations to the design may influence these findings. Novus should be contacted to provide additional comments and/or recommendations for additional analysis of design revisions.

Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely,
Novus Environmental Inc.

Bill F. Waechter, C.E.T.
Senior Specialist – Microclimate

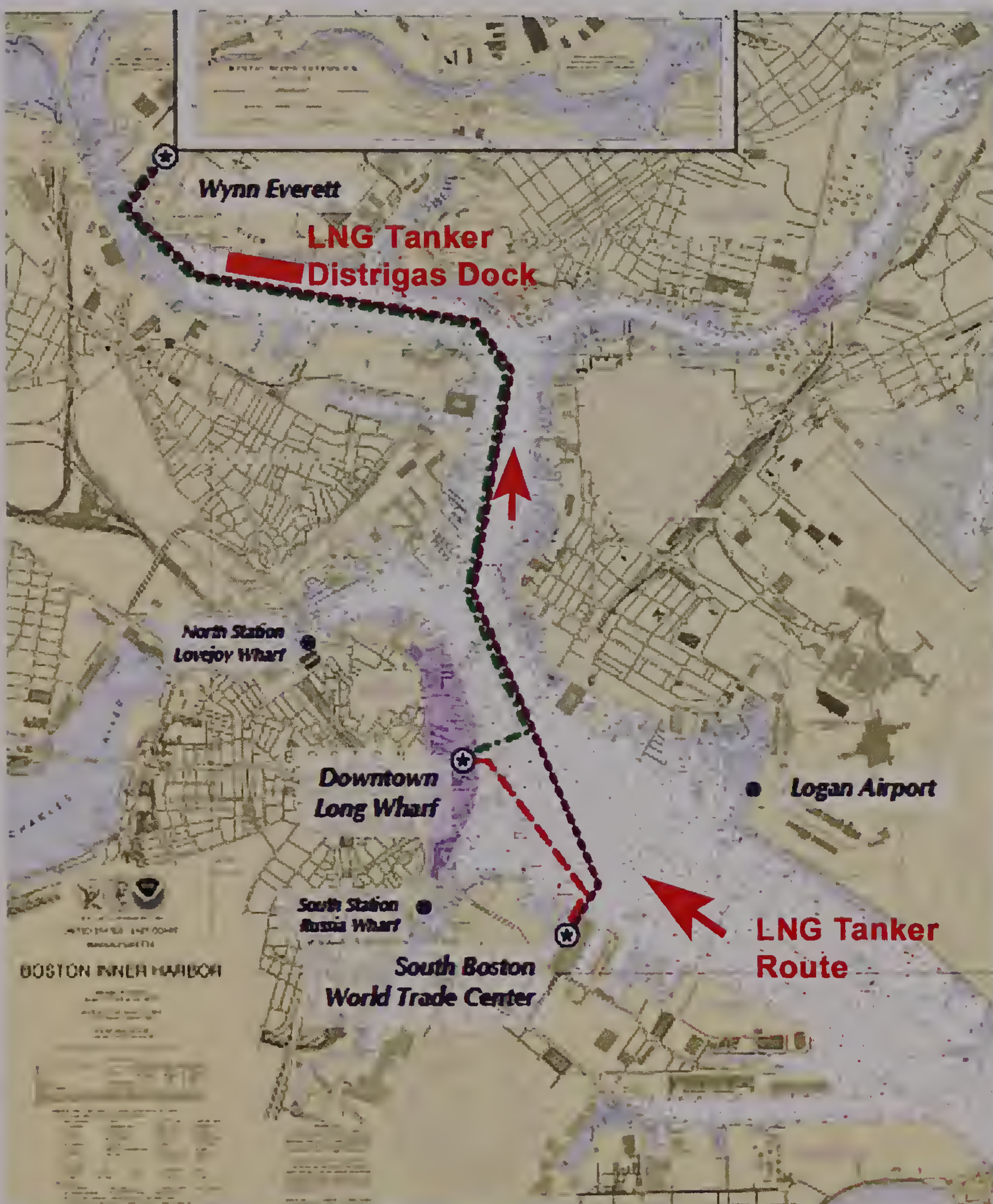
Tahrana Lovlin, MAES, P.Eng.
Specialist - Microclimate

Appendix G

Attachment to Comment Letter from J. Vitagliano

Wynn-Everett Ferry Conflict With LNG Tankers
Ferry Prohited During LNG Passage & Off-Loading at Distrigas

Overlaid Onto FEIR Ferry Route Chart



JV

Figure 2-27
Proposed Passenger Ferry Route to Boston
Source: Norris & Norris Associates, 2013; Fort Point Associates, 2013


Wynn-to-
LNG Distance
Wynn
Everett
Site
Distrigas
LNG Tanks
4,000 ft.
LNG Tanker
Offloading
© 2014 Google
Google earth
1995
42°23'31.58" N 71°03'52.87" W elev 55 ft eye alt 6357 ft
Artisan Way
Mystic View Rd
Revolution Dr
Assembly Square Dr
Alford St
Dexter St
Mystic St
Lynde St
Beacham St
Behen St
Market St
99

Boston Harbor LNG Tanker Restrictions

CODE OF FEDERAL REGULATIONS

Data is current as of July 31, 2014

Title 33: Navigation and Navigable Waters

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§165.110 Safety and Security Zone; Liquefied Natural Gas Carrier Transits and Anchorage Operations, Boston, Massachusetts.

(a) *Definitions.* As used in this section—

Authorized representative means a Coast Guard commissioned, warrant, or petty officer or a Federal, State, or local law enforcement officer designated by or assisting the Captain of the Port (COTP) Boston.

Deepwater port means any facility or structure meeting the definition of deepwater port in 33 CFR 148.5.

Support vessel means any vessel meeting the definition of support vessel in 33 CFR 148.5.

(b) *Location.* The following areas are safety and security zones:

(1) *Vessels underway.* All navigable waters of the United States within the Captain of the Port (COTP) Boston zone, as defined in 33 CFR 3.05-10, two miles ahead and one mile astern, and 500 yards on each side of any liquefied natural gas carrier (LNGC) vessel while underway.

(2) *Vessels anchored in the Broad Sound.* All waters within a 500-yard radius of any anchored LNGC vessel located in the waters of Broad Sound bounded by a line starting at position 42 deg. 25′ N, 070 deg. 58′ W; then running southeast to position 42 deg. 22′ N, 070 deg. 56′ W; then running east to position 42 deg. 22′ N, 070 deg. 50′ W; then running north to position 42 deg. 25′ N, 070 deg. 50′ W; then running west back to the starting point (NAD 83).

(3) *Vessels moored at the Distrigas LNG facility.* All waters within a 400-yard radius of any LNGC vessel moored at the Distrigas LNG facility in Everett, MA.

(4) *Vessels calling on a deepwater port.* All waters within a 500-meter radius of any LNGC engaged in regasification or transfer, or otherwise moored, anchored, or affixed to a deepwater port listed in 33 CFR 150.490 and falling within the waters of the Boston COTP Zone, as defined in 33 CFR 3.05-10.

(c) *Regulations.* (1) In accordance with the general regulations in Sec. 165.23 and Sec. 165.33 of this part, entry into or movement within these zones is prohibited unless authorized by the Captain of the Port Boston, or his/her authorized representative.

(2) No person or vessel may enter the waters within the boundaries of the safety and security zones described in paragraph (b) of this section unless previously authorized by the COTP Boston, or his/her authorized representative. However, LNGCs and support vessels, as defined in 33 CFR 148.5, operating in the vicinity of NEGDWP are authorized to enter and move within such zones in the normal course of their operations following the requirements set forth in 33 CFR 150.340 and 150.345, respectively.

(3) All vessels operating within the safety and security zones described in paragraph (b) of this section must comply with the instructions of the COTP or his/her authorized representative.

[CGD01-02-023, 67 FR 63263, Oct. 11, 2002, as amended by USCG-2007-0087, 73 FR 34194, June 17, 2008]

LNG Tankers in Boston Inner Harbor are:

Dangerous!

- This Boston Globe illustration (Dec. 12, 2004), details how much of the area around Boston Harbor would be seriously effected by a LNG tanker explosion.
- Neighborhoods abutting Boston Harbor would be leveled by a blast, and people nearly a mile away could suffer serious burns.

Make your voice heard!

Expensive!

- LNG deliveries into Boston Inner Harbor cost us in police overtime, Coast Guard services, and the closing of the Harbor to commercial traffic.
- Overtime costs for the Boston Police Department alone total over $750,000 a year, money that could be spent on the city's public safety, schools, and roads.

Avoidable!

- There are proposals in place to move these dangerous LNG tankers out of Boston Harbor.
- Two proposals would place terminals 10 miles out to sea near Gloucester.
- Another proposal would place a terminal on Battery Rock, roughly 10 miles away from Boston.

Disruptive!

- Neighborhoods around Boston Harbor are forced to deal with the closing of roads and bridges as LNG tankers travel through the harbor.
- Business is not only affected by those closures, but Boston's shipping industry comes to a standstill as the waterway is closed when a tanker comes into the harbor.
- Logan Airport's notorious delays are exacerbated by the need to close active runways during LNG tanker passage.

IAGS Energy Security

Prepared by the Institute for the Analysis of Global Security

January 21, 2004
Contact IAGS: info@iags.org
To subscribe, send a blank email to subscribe@iags.org
To unsubscribe, send a blank email to unsubscribe@iags.org

Study: LNG - Not in my backyard

In recent years America's gas market has been primed for volatility largely because of declining domestic supplies. To keep prices in check and limit the global influence of the oil cartel, many have advocated increasing imports of liquefied natural gas (LNG), natural gas cooled at extremely low temperature and high pressure until it contracts into a liquid which then can be transported worldwide by tankers. The liquid is unloaded at regasification terminals which turn it back into gas fed into pipelines for distribution. The U.S. Department of Energy expects LNG to account for 15% of U.S. gas consumption by 2025, compared to 1% today. Consequently, LNG imports into the U.S. are expected to grow by about 8.2% a year over the coming decade. U.S. Federal Reserve Bank chairman Alan Greenspan testified repeatedly before Congress that LNG was the only solution on the horizon for the projected chronic natural gas shortage.

However, LNG is highly volatile and in the era of terrorism may offer more opportunities for terrorist strikes on vulnerable energy infrastructure targets located near residential neighborhoods. One such disaster scenario was developed by James Fay, a professor emeritus of mechanical engineering at Massachusetts Institute of Technology, a former chairman of the Massachusetts Port Authority and a member of the Union of Concerned Scientists. Fay is indeed concerned. He predicts parts of Rhode Island and Massachusetts could be devastated by an attack on LNG tankers regularly passing through navigation canals close to residential areas in Boston and the Rhode Island shoreline on their way to the terminal in Everett, Mass.

In an interview with *Energy Security* Fay said a terrorist attack by a boat bomb - such as the one used against the USS Cole in 2000 or the French tanker Limburg off the coast of Yemen in 2002 - could cause at least half a cargo hold's worth of LNG to seep out of the ship and ignite. "In just over three minutes, the fire could spread two-thirds of a mile from the ship," Fay said. "There is nothing safety officials can do in such a case. They would have no time to evacuate people or to put out the fire." Fay also predicts damaging thermal radiation within a mile radius of the tanker which could set fire to thousands of homes and cause significant losses of blood and treasure. "Like the attack on the World Trade Center in New York City, there exists no relevant industrial experience with fires of this scale from which to project measures for securing public safety," he says. Fay insists the methodology of his modeling is sound.

Terror's Next Target
Attacks on the West's oil and gas infrastructure -- from production facilities to pipelines and tankers -- are likely to be the next "mega" target of terrorists, and could wreak havoc with the world's economy, according to an in-depth IAGS analysis of the susceptibility of the energy industry featured in the latest Journal of International Security Affairs (Winter 2004).

Minding Its Business
Saudi Arabia, which has demonstrated its willingness to use its vast oil reserves as a foreign policy tool, has not acted to aid U.S. efforts to rebuild Iraq.

Fencing in looters and saboteurs in Iraq
Too many people in and outside of Iraq are hoping to deny Iraq a better future through a campaign of sabotage and plunder of the country's neglected oil facilities. The problem, and possible solutions.

Energy security and liquefied natural gas
Demand for natural gas has increased as have the security vulnerabilities presented by liquefied natural gas terminals and tankers.

Under the Radar

Oil, terrorism and drugs intermingle in Colombia
Seventy U.S. Special Forces soldiers are training Colombians to protect an oil pipeline.

[**Japan's struggle to secure future oil supply**]
Energy dependent Japan looks to Iran for oil, causing tension with the U.S.

[**Chad-Cameroon pipeline project put to test**]
Will the pipeline, partially financed by the World Bank, improve the lot of Chad and Cameroon or exacerbate existing corruption and strife?

[**Natural resource curse hits São Tomé**]
A tiny West African country illustrates a well known problem.

ON THE TECHNOLOGY FRONT

[**Fuel Cell Locomotive for Military and Commercial Railways**]
An international consortium is developing the world' s largest fuel cell vehicle, a 109 metric-ton, 1 MW locomotive.

[**Fuel cell power plant installed at NJ Sheraton**]
A stationary fuel cell will supply 250 kilowatts of electric power as well as heat to the Sheraton Edison Hotel, accounting for about 25% of the hotel's electricity and hot water.

[**Fuel cell scooters for Europe and China**]
Palcan's fuel cell powered scooter is designed to address the world's need for a low-end mass transport vehicle.

[**U.S. Air Force to get fuel cell bus**]
Fuel cell powered thirty-foot hybrid bus to be stationed at the Hickam Air Force Base in Hawaii.

Fay's analysis, as well as that of other experts, has sparked a debate in New England as well as in other states where LNG terminals operate or are under consideration. In addition to the Everett facility there are operational plants at Cove Point in the Chesapeake Bay, Maryland, in Savannah, Georgia, and in Lake Charles, Louisiana. LNG tankers are very conspicuous. Their distinctive storage tanks jut like humps on the decks; their identity cannot be mistaken. Terrorists attempting to target such a ship will have no problem identifying it. Furthermore LNG installations can be attacked onshore by truck bombs with similarly damaging consequences.

Alabama Governor Bob Riley sent letters to the Federal Energy Regulatory Commission and the Alabama Port Authority saying he will block sale of state-owned land to ExxonMobile for use as an LNG terminal "until an independent safety study has been completed and evaluated," specifying it should be "a study that considers the most credible worst-case scenario." Gov. Riley's letter states that " Only in this way can [..] all parties concerned by apprised of the actual possible outcomes of an accident or terrorist attack."

Boston Mayor Thomas Menino recently decided to rid Boston Harbor of its long-standing LNG facility over safety concerns. "Everyone should be concerned about it because the Coast Guard, Boston fire department and other agencies do not have the equipment if something did happen with an LNG tanker. Everyone says there is no problems, but what happens when something does happen?" Menino said this past December when the national threat level was elevated to orange. Menino and other representatives of Boston-area communities had mounted an unsuccessful lawsuit to halt the LNG operations after Sept. 11, 2001. Professor Fay agrees. "Federal officials are at a state of denial right now. They ignore the scenario of tanker spill as a problem they have to deal with." Menino has no jurisdiction in the harbor so the tankers are still coming.

The Coast Guard however is not ignoring the threat. It has taken some precautions to minimize the risk of attack against LNG tankers. Fast escort boats shepherd each gas tanker as it travels to the terminal. A security zone extending 500 yards on each side, two miles ahead and a mile behind the tanker is imposed and other vessels are instructed to give the tanker a wide berth during its passage and 12-hour unloading process. Violators face arrest, fines of up to $25,000 and prison terms of up to 10 years. But these penalties are unlikely to deter suicide terrorists such as those who flew planes into the World Trade Center and the Pentagon. It is not clear what procedures the Coast Guard would be willing to use once a terrorist boat penetrates into the security zone. Nor it is clear how rapidly security officials could respond to the threat. After all, well armed and vigilant military targets like the USS Cole could not prevent such an attack.

BACK ISSUES

LNG tanker

The safety concerns surrounding LNG installations pose difficulties for energy companies attempting to build new terminals. No such terminals have been built in the U.S. for two decades, but applications to construct 30 more have been made in recent years. Only half a dozen are likely to materialize in the next decade. ExxonMobil has announced plans to build a $600 million plant on the Texas coast and wants to build three more in other states. ChevronTexaco announced plans to construct an off the coast of Baja California, Mexico and Royal Dutch/Shell and BP are among other companies driving to build new terminals in California, Texas, Alabama, Florida, Mexico, Nova Scotia and other locations. In most of these places opposition by local communities is mounting and it is not yet clear which consideration will prevail: public safety or economic need.

Also see:
Threats to oil transport

Energy security and liquefied natural gas

Greenspan warns on implications of natural gas shortage

The U.S. faces a shortage of natural gas
TOP

Physicians for Social Responsibility

Energy Security Initiative

Working for a safe and sustainable energy future

NO SAFE HARBOR: SECURITY THREATS OF LNG

Molly Farneth, *Scoville Peace Fellow*

Liquefied natural gas (LNG) is natural gas – primarily methane[1] – supercooled to its liquid form at minus 259 degrees Fahrenheit. LNG has 1/600th the volume of vaporized natural gas, making it efficient for storage and transportation.[2] It is colorless, odorless, and nontoxic. When regasified, LNG can be used for the same purposes as conventional natural gas, including heating and power generation. LNG comprises fifteen percent of all gas used in New England.[3]

The United States imports most of its LNG, which is transported in large, double-hulled tankers. There are six LNG terminals currently in operation in the United States, although the construction of nearly twenty additional terminals is under consideration. According to the Energy Information Administration, there are 96 active LNG storage facilities in the United States.[4] Several of these terminals and storage facilities are located in close proximity to population centers. In order to access the Distrigas LNG terminal in Everett, Massachusetts, for instance, LNG tankers must pass through Boston Harbor.

Vulnerabilities

As a liquid, LNG is not explosive, and LNG vapor is flammable only at a certain concentration when mixed with air. LNG is, however, considered a hazardous material due to its potential for combustion once regasified,[5] and when these conditions are met, a devastating fire or explosion can result.

One threat posed by liquefied natural gas shipment is the possibility of an LNG pool fire. Since LNG is lighter than water, spilled LNG will float on water, creating an "LNG pool" that expands away from the source of the spill. If ignited, the gas that rapidly evaporates off of the pool will ignite and burn, just above the spreading pool. LNG fires burn more hotly and rapidly than oil or gasoline fires, and cannot be extinguished. Rather, they burn until all LNG is consumed. The thermal radiation from LNG pool fires can cause serious injury and even death a considerable distance away from the fire itself.[6] Jerry Havens, chemical engineer and former director of the Chemical Hazards Research Center at the University of Arkansas states:

> If even one of the five tanks onboard an LNG ship spilled into the water, the fire it would produce would be up to a half-mile in diameter. The thermal radiation . . . could burn people a half mile from the fire's edge.[7]

According to Dr. James Fay of the Massachusetts Institute of Technology, the average heat release rate of a LNG pool fire "is about twice the average thermal power consumption of all U.S. fossil fuel electric power plants."[8] This is the most serious threat posed by a spill of liquefied natural gas, and would be the goal of an intentional attack on LNG infrastructure.

If LNG spills but is not immediately ignited, it will evaporate, forming a vapor cloud that may drift away from the original site. To catch fire, the vapor cloud must encounter an ignition source; if this occurs, the cloud will ignite. Otherwise, it will dissipate into the atmosphere.

A final risk associated with LNG spills is the possibility of a flameless explosion. When the highly cooled liquefied natural gas spills onto water, it can heat up and rapidly vaporize in a flameless explosion. The hazard zone around this type of explosion is smaller than that around a vapor cloud or pool fire.[9]

LNG and Terrorism

According to a study by Lloyd's Register of Shipping, terrorists who blasted small holes in the inner and outer hulls of an LNG tanker could create a destructive series of explosions and fires. The ship, according to the study, "would become a total loss with a continuous fire that would be inextinguishable until all gas had been consumed."[10] In the case of the resulting fire, the hazard exclusion zones may be insufficient to protect people from the effects of the thermal radiation.

Although LNG infrastructure has not been subject to a terrorist attack to date, tankers and LNG facilities remain vulnerable targets. Similar oil and gas facilities have been successfully attacked and several LNG accidents highlight their

vulnerabilities.

- Federal warnings regarding al Qaeda threats to the U.S. since September 2001 have frequently mentioned energy infrastructure.[11]

- An accidental explosion at an LNG plant in Algeria in January 2004 killed 22, injured 74, and caused $800 million in damage.[12]

- According to Richard Clarke, the former counterterrorism czar for both President Bill Clinton and George W. Bush, "After the Millennium Terrorist Alert, we had learned that al Qaeda operatives had been infiltrating Boston by coming in on liquid natural gas tankers from Algeria. We had also learned that had one of the giant tankers blown up in the harbor, it would have wiped out downtown Boston."[13]

Conclusion

As natural gas prices have increased in the past five years, the Bush administration has proposed expanding importation of LNG. In addition to increasing the threat to American harbors, the Union of Concerned Scientists notes that this expansion would lead to LNG dependency on many of the same countries upon which the United States is depends for oil.[14] In light of the variety of security threats LNG poses, rigorous environmental and security impact assessments must be conducted and security recommendations must be implemented to decrease the associated risks before LNG can be promoted as an alternative to other fossil fuels. Moreover, it is worth noting that, according to Amory Lovins of the Rocky Mountain Institute, "all the energy now supplied by LNG and LPG[15] can be replaced by much cheaper sources which do not compromise national security."[16] These alternatives include solar electricity, wind power, and biomass resources—all decentralized energy sources that virtually eliminate the terrorist threat associated with current energy infrastructure—and other, safer hydrocarbon-based fuel supplies like domestically produced natural gas.

Physicians for Social Responsibility's Energy Security Initiative is dedicated to advancing a national energy policy that protects public health, defends the environment and strengthens national and global security. As terrorist organizations threaten energy infrastructure in the United States and worldwide, it is imperative to adopt a new strategy to meet America's energy needs.

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1 Natural gas is primarily methane, with low concentrations of other hydrocarbons, water, carbon dioxide, nitrogen, oxygen, and sulfur compounds.

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This is a publication of Physicians for Social Responsibility's Energy Security Initiative.

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LNG STORAGE AND TRANSIT IN BOSTON

BY

DEPUTY CHIEF JOSEPH M. FLEMING
BOSTON FIRE DEPARTMENT

THIS REPORT WILL ADDRESS THE FOLLOWING QUESTIONS:

- HOW BIG WILL THE INITIAL FIRE BE?
- WILL INITIAL FIRE CAUSE FURTHER DAMAGE?
- HOW LONG WILL THE FIRE LAST?
- WHAT ARE DANGEROUS LEVELS OF RADIANT HEAT (HEAT FLUX)?
- CAN THE INFORMATION IN ITEMS 1-4 BFD BE USED TO DEVELOP RESPONSE GUIDELINES?
- ARE THERE OTHER AREAS IN NEED OF CLARIFICATION?
- WHY WAS THERE UNCERTAINTY REGARDING THESE ISSUES? - WHO HAS JURISDICTION?
- CAN THE APPLICABLE REGULATIONS BE IMPROVED?

GOVERNMENT/INDUSTRY ESTIMATES OF THE INITIAL FIRE

- THE LLOYD"S REPORT
  - *"The Lloyd's Report, commissioned by Tractabel LNG North America LLC, the company that runs the Everett LNG terminal, instead concluded that, at worst, an attack on a tanker would "create a slow moving relatively confined fire.""*- Boston Globe 10/13/01.
  - This Report is important because, *"The Lloyd's Report was used by the Coast Guard in approving a safety plan for the Everett site."* - Providence Journal, 01/04/04.
- THE QUEST REPORT
  - "J. Robinson, of FERC, said Quest would continue to use the Quest Report, That study with a relatively mild assessment of the dangers posed by federal officials to suggest that an accident involving one of the tankers would only impact a small area." - Mobile Register, 11/25/03.

EST. OF HEAT - 1M^2 HOLE

	7,000 BTU per hr-ft^2	4,800 BTU per hr-ft^2	4,000 BTU per hr-ft^2	1,500 BTU per hr-ft^2
FAY 1m^2 Hole	1,280 ft.	Approx. 1,750 ft.	1,598 ft.	2,417 ft.
QUEST 1m^2 Hole	835 ft.	Approx. 900 ft.	1020 ft.	1,420 ft.
LLOYD'S 1m^2 Hole (20m pool)		175 ft.		
LLOYD'S 1m^2 Hole (50m pool)		300 ft.		

Note: Fay estimates are approximately 50% higher than Quest's.
Fay's estimates are 3 or more times greater than Lloyd's.

A 1m^2 hole fire should last approximately 30 minutes.

EST. OF HEAT FLUX - $5M^2$ HOLE

	10,000 BTU per $Hr\text{-}ft^2$	7,000 BTU per $hr\text{-}ft^2$	6,000 BTU per $hr\text{-}ft^2$	4,000 BTU per $hr\text{-}ft^2$	1,500 BTU per $hr\text{-}ft^2$
KOOPMAN $5m^2$ Hole	1,850 ft.		2,600 ft.		4,200 ft.
FAY $10m^2$ Hole	1,834 ft.	2,045 ft.		2,477 ft.	3,622 ft.
QUEST $5m^2$ Hole* (Inner Harbor)		>1,020 ft.		>1,260 ft.	>1,770 ft.
QUEST $5m^2$ Hole (Outer Harbor)		1,020 ft		1,260 ft.	1,770 ft.

* *Quest' distances for the inner harbor would most likely be larger than numbers for the outer harbor. (later slide will explain.)*

Note: Fay & Koopman's estimates are approximately double Quest's "outer harbor" estimates.

A 5-10m^2 hole fire should last approximately 5 minutes.

WHY ARE ESTIMATES SO DIFFERENT?

- Originally Quest stated
  - *"The calculations (of the 10/10 Report) would address a national security concern with the Boston LNG Terminal following the 9/11/03 attacks."* – Mobile Register 10/19/03.
- Later, in 11/03, Quest stated in a letter to DOE.
  - That Quest modeled a ship collision in the outer harbor as the. *"most credible worst case event"*.
  - This assumption allowed Quest to take into account "wave action", which caused pool size to be smaller. Quest also wrote, *"It is important to note that the model developed by Quest is flexible in the sense that other locations with different site-specific conditions may yield significantly different results".*
- However, in a 07/02 e-mail D. Juckett of the DOE wrote,
  - "To put together the original scenario DOE coordinated: State Officials, DOT, USCG, industry , and others. - *Did this group agree to "outer harbor accident" scenario? BFD was not included in discussions.*

WILL FURTHER FAILURE OCCUR?

- "There is a possibility of escalating failure of the ship structure due to embrittlement, followed by an internal explosion caused by either a rapid phase transition, or by a gas air mixture being ignited."
  - *(From page 90 Overall Conclusions - Lloyd's Report).*
- "Fires on the ship or adjacent to the ship may lead to high temperatures on the hull, the tank walls, insulation, and tank support structures which further can lead to failure of the cargo containment system and release of cargo."
  - *(T. K. Authen, in a paper titled, Gas Carriers – Effects of Fire on the Cargo Containment System. - Gastech Conference proceedings)*
- "A pool fire caused by LNG release from one tank may threaten the integrity of adjacent tanks."
  - *(Solberg et al in a paper titled, Assessment of Consequences from Accidental release of Liquefied Gases - Gastech Conference proceedings)*

EFFECT OF HEAT ON STEEL

- **"The heat flux exposure for all locations on the deck will be approximately 100Kw/m^2 ". This is equivalent to 32, 700 BTU/hr/ft2.** *(Solberg et al in a paper titled, Assessment of Consequences from Accidental release of Liquefied Gases - Gastech Conference Proceedings)*
- **"A heat flux of 7,000 Btu/hr/ft^2 will weaken structural steel after prolonged exposure".** *(Statement made by Quest in the 11/17/03 letter to the DOE)*
- **Perhaps that is why - "Most predictions suggest that even the largest LNG tankers (typically more than 900 feet in length) might be completely enveloped in a pool fire following a complete spill of a single 6.5 million gallon tank. This raises questions about the vulnerability of the ship and the potential for additional releases."** *(Haven, "Terrorism: Ready to Blow.")*

DESPITE THIS EVIDENCE, QUEST DID NOT CONSIDER CASCADING FAILURE OF TANKS.

WHAT ARE DANGEROUS LEVELS OF RADIANT HEAT?

- **NATIONAL FIRE PROTECTION ASSOCIATION'S GUIDELINES - (59A, LNG STANDARD, 2006 EDITION)**
  - Adopted through reference by federal and state governments, including Massachusetts
    - *Provisions shall be made to prevent thermal radiation flux from a fire from exceeding the following limits :*
      - *1600 Btu/hr/ft2 (5000 w/m2) at the nearest point located outside the owner's property in existence at siting and <u>used for outdoor assembly</u>.*
      - *3000 Btu/hr/ft2 (9000 W/m2) at the nearest point of the building outside the owner's property line in existence at time of siting and used for <u>assembly, educational, health care, detention or residential.</u>*
      - *10,000 Btu/hr/ft2 (30,000 W/m2) at a property line that can be built upon for a fire over an impounding area.*
- ***These are not just technical decisions. They involve "value judgments".***

WHAT DO THESE "ACCEPTABLE" LEVELS MEAN?

- 1600 Btu/hr/ft^2 - The NFPA Committee members consider this level of radiation acceptable for an outside assembly location.
  - This level of heat flux will cause 2nd degree burns in 30 seconds.
  - This level of heat flux will cause extreme pain in 15-20 seconds.
  - Fatal to 1% of the affected population in 60 seconds. (According to a Quest Report)
  - Educational occupancies often have playgrounds but the level for educational occupancies is 3,000 BTU/hr/ft^2
  - This might not sound acceptable to everyone.
    - The Society of Fire Protection Engineers Handbook recommends 750 Btu/hr/ft2 (1/2 of the NFPA's acceptable level) as a recommended maximum to allows for people to safely evacuate.

WHAT DO THESE "ACCEPTABLE" LEVELS MEAN?

- 3000 Btu/hr/ft^2 - The NFPA Committee members consider a this level of radiation acceptable for buildings containing educational and healthcare occupancies.
  - This level of heat flux will cause 2nd degree burns in 15 seconds.
  - Fatal to 50% of the affected population in 60 seconds. (According to a Quest Report.)
- This exceeds the level suggested as a maximum for wildland firefighting, 2,200 BTU/hr/ft^2 (7 KW/m^2).
- Why is it "acceptable" to potentially expose school children to these types of heat flux?
- What about bedridden hospital patients exposed to radiation passing through glass windows?

BFD GUIDELINES FOR HEAT FLUX (RADIATION) EXPOSURE

10,000 (BTU/hr-ft^2)	Assume concrete structures will fail. No rescue or fire fighting activity possible.
7,000 (BTU/hr-ft^2)	Assume steel structures will fail. Assume buildings will ignite after a short duration No rescue or fire fighting activity possible.
4,000 (BTU/hr-ft^2)	Assume buildings will ignite after more than 30 mins. No fire fighting activity except for life safety. FFs exposure should be limited to a few minutes.
2,500 – 4,000 (BTU/hr-ft^2)	Buildings should not burn at this level, from pool fire but may eventually burn due to adjacent building fires Evacuate civilians using as much shielding as possible.)
1,500 – 2,500 (BTU/hr-ft^2)	Buildings should not burn, so defend in place. Firefighters should be able to operate reasonable safely in this zone with proper bunker gear.
500 – 1500 (BTU/hr-ft^2)	Buildings should not burn, so defend in place. Non –firefighters should be able to operate reasonable safely, for short periods to assist in evacuation.

USDA Forest Service estimates max exposure, for 90 seconds, for FF, with head and neck protection, to be 7.0 KW/m^2 (2,200 BTU/hr/ft^2).

BFD EST. OF HAZARD DISTANCES - 2002 (APPROX AVE OF FAY AND QUEST)

	BFD ESTIMATED DIST TO HEAT FLUX		QUEST	SANDIA
	$1M^2$ HOLE	*$5M^2$ HOLE*	$5M^2$ HOLE	*"INTENTIONAL"*
12,000 BTU/hr/ft^2				1,465 ft
7,000 BTU/hr/ft^2	1,100 ft	*1,500 ft*	1,020 ft	
4,000 BTU/hr/ft^2	1,300 feet	*1,900 feet*	1,280 ft	Est. > 2,000 ft
2,500 BTU/hr/ft^2	1,600 feet	*2,250 feet**		
1,500 BTU/hr/ft^2	1,800 feet	*2,700 feet*		4,800 ft

Original 2002 BFD estimate of hazard distances,for 5m^2 hole, was much closer to Sandia's 12/04 estimate than the estimate by QUEST used by DOE and USCG.

WHO HAS VESSEL JURISDICTION?

- BFD Assumed that the agency that authorize the hazard analysis, e.g. the Quest Study, was the agency that had jurisdiction.
- The "State"?
  - USCG informed BFD it was the State. (05/02)
  - The Exec Office of Public Safety denied involvement. (06/02)
  - Juckett, from the DOE identified, M. Bolden, Under Sect. of Public Safety as making request for a study to DOE. (07/03)
- The DOE?
  - Junkett stated in an e-mail that DOE, *"was able to task Quest using existing governement funds"*.(07/03)
  - DOE Press Officer, Drew Malcolmb later stated, *"DOE was not involved with the study in any way".(–* Mobile Register 10/19/03)
- FERC (Federal Energy Regulatory Commission)?
  - J, Robinson of FERC stated, *"FERC does not set exclusion zones around tankers." But he also stated, "FERC had used and would continue to use the Quest Study".* (Mobile Register, 11/25/03.

WHY THERE IS A NEED FOR AN "INDEPENDENT REVIEW"

- ***Surveys of almost 1,500 members of…professional societies (e.g. environmental economics, epidemiology, exposure assessment, industrial hygiene, toxicology) found that 3 in 10 respondents had observed a biased research design, 2 in 10 had observed plagiarism, and 1 in 10 observed data fabrication or falsification. Respondents with many years in risk analysis, business consultants, and industrial hygienists reported the greatest prevalence of misconduct. These respondents perceived poor science, <u>economic implications</u> of the research, and lack of training in ethics as causes of misconduct.*** *(Greenberg and Goldberg, 1994: 223)* - Minding the Machines

WHY THERE IS A NEED FOR "PUBLIC PARTICIPATION"

- *"Controversies have politicized the issue of risk. Risk assessment is no longer seen as simply an exercise in the technical measurement of risk. Questions of risk can no longer be defined simply in technical terms; they must also be defined in political and social terms, because the real question is not how safe it is, but how safe is safe enough for individuals and society? Moreover, since technical risk assessors are no more qualified than the general public to assess value judgements ... The view that the public perception of risk is distorted by subjective biases and that only experts can define the "real" risks is overly simplistic. Experts are also subject to biases in interpreting quantitative data, especially when objective uncertainties are present. Many so-called objective assessments ultimately depend on the subjective interpretations and normative judgements of engineers and applied scientists."* - Minding the Machines

BFD REGULATORY RECCOMENDATIONS (2002)

- Owners of LNG hazards should provide a comprehensive report which should include:
  - Analysis of “reasonable worst case scenarios” using risk and hazard analysis (including terrorist attacks).
    - Note: risk analysis takes into account probability.
  - The consequences should be described in terms of impact on surrounding infrastructure, communities and terminals - not just heat flux estimates.
    - When analyzing consequences, use the “acceptable” criteria recommended by the BFD as opposed to NFPA’s.
  - Identification of specific required capabilities on-site, or in the local community, that are <u>in place, or more importantly - not in place,</u> to manage these consequences.
    - Do first responders have resources to mitigate the consequences?

"ASSESSING THE SUITABILITY OF A WATERWAY FOR LNG MARINE TRAFFIC" (USCG - NCIV 05-05)

- *Finally, in May 0f 2005 USCG takes responsibility for evaluating LNG Risks on Water.*
  - *Section 6. c - "LNG facilities in operation prior to the publication of this Circular; Current safeguards and security measures for LNG terminals, including related LNG marine traffic, that were in operation prior to the publication of this Circular should be considered appropriate. However, they are subject to case-by-case review if circumstances warrant. Modification or expansion of existing facilities may be such a circumstance."* (Essentially "grandfathers" existing facilities.)
  - *Section 4. b. – "The <u>Sandia Labs Report</u> provided foundation for USCG position on LNG and provided basis for evaluating risks."*

BUT – ACCORDING TO SANDIA LABS (12/04) REPORT …

- **In Zone 1 – *"Incident management and emergency response measures should be carefully evaluated to <u>ensure adequate resources (I.e. firefighting and salvage)</u> are available for consequence and risk management."***
- **In Zone 2 – *"Strategies should include incident management and emergency response measures that ensure areas of refuge(enclosed areas, buildings) are available. The development of community warning procedures and educational programs to ensure that are aware of precautionary measures."***

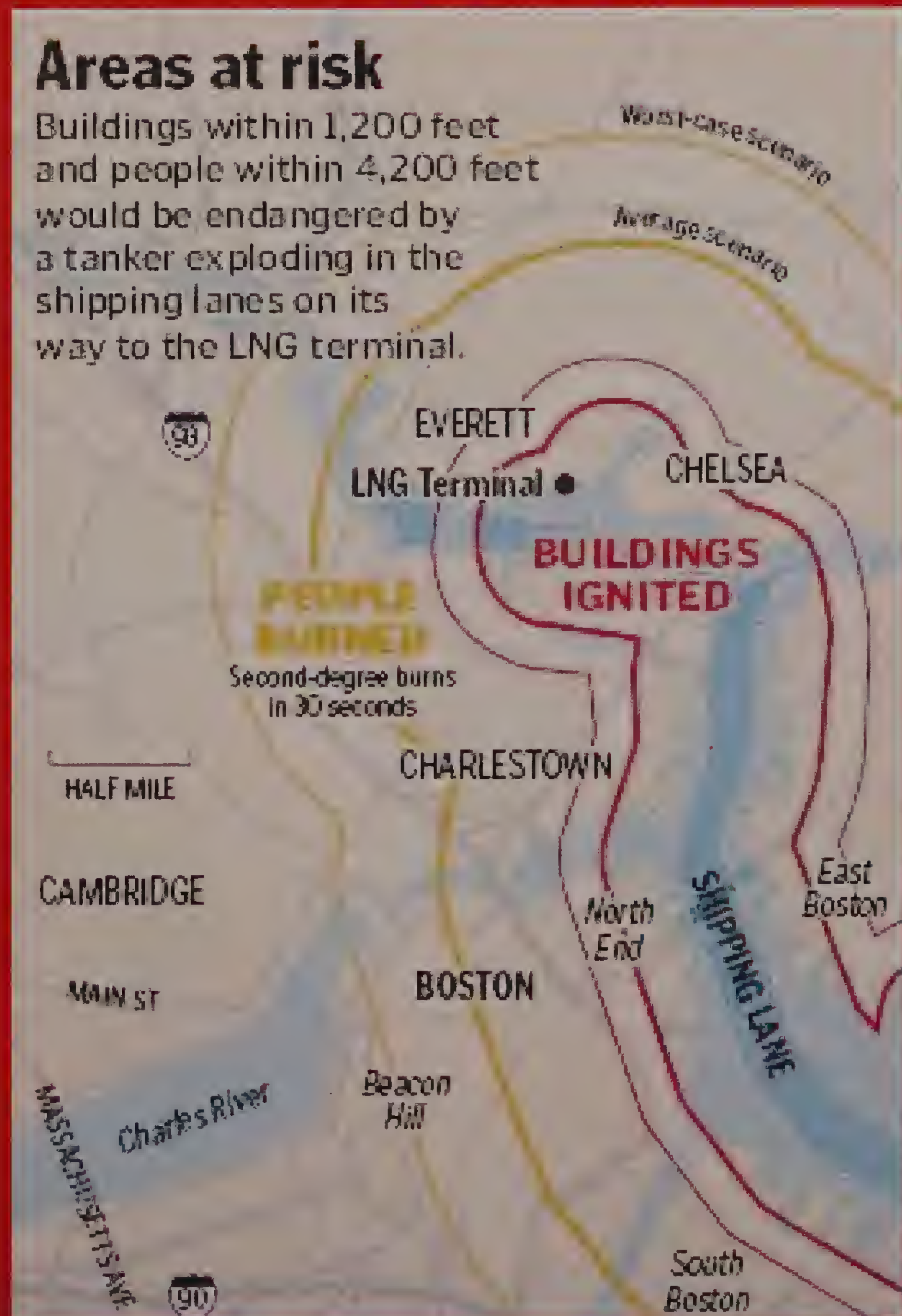
WHY NOT APPLY THESE CONCEPTS TO EXISTING SITUATIONS LIKE BOSTON HARBOR?

LNG TRANSIT IN HARBOR

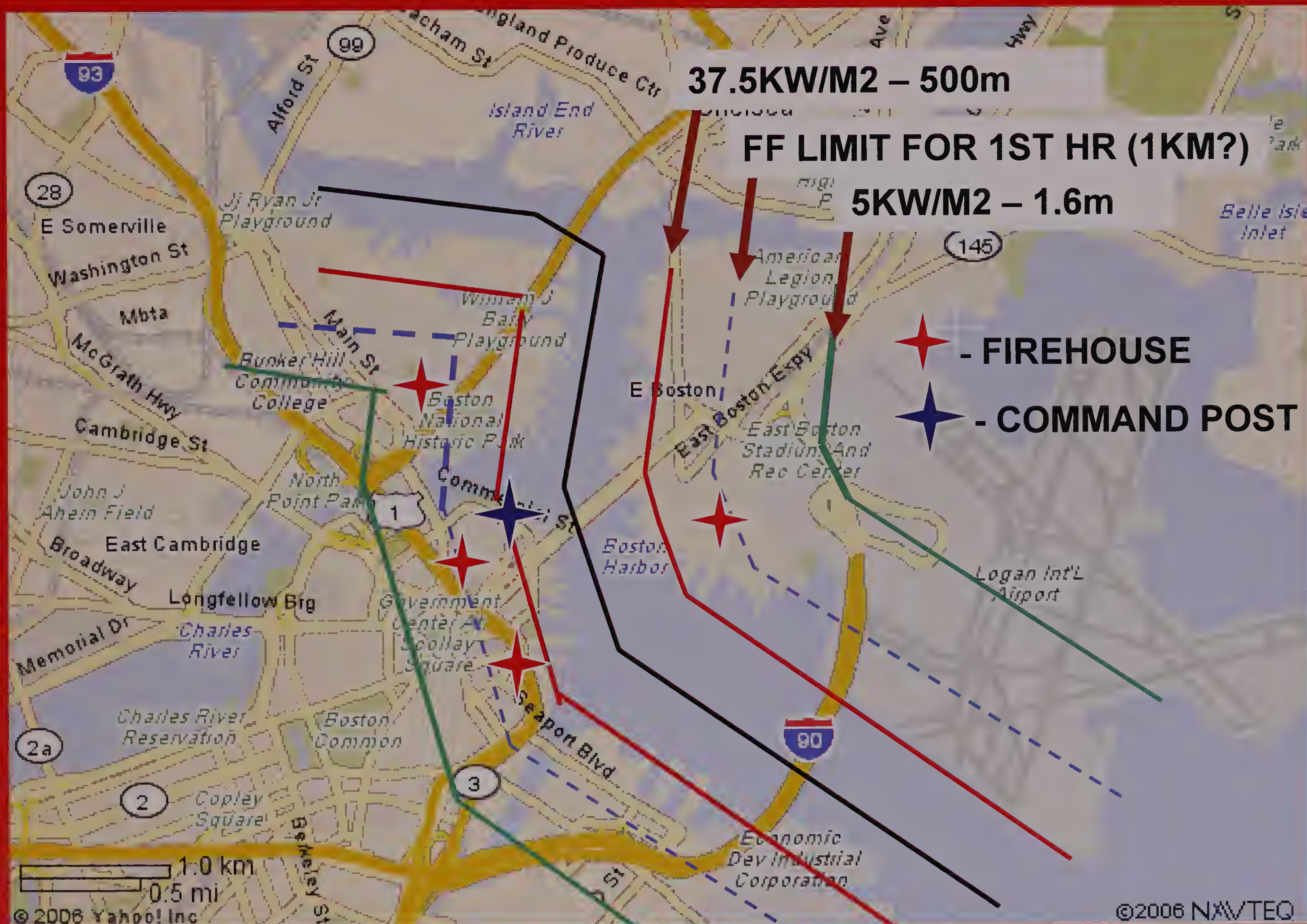
VESSEL IS ABOUT
900 FT LONG

LNG PASSING BY
CHARLESTOWN
CONDOMIUMS

HAZARD ZONES (LNG IN HARBOR) – BOSTON GLOBE/SANDIA



HAZARD ZONES BASED ON SANDIA ESTIMATES



COMMENTS ON HAZARD ZONES – "INTENTIONAL INCIDENT"

- Command Post and at least 1 Firehouse potentially in Sandia's Zone 1 – "Consequences could be significant. Thermal radiation poses a severe public safety and property hazard, and can damage or disrupt critical infrastructure".
- 2 possibly 3 firehouse located in area where firefighting probably limited due to thermal radiation. (Approximately 7-10 KW/M^2"
- Dozens of buildings, some hi-rise residential, potentially within 20 KW/M^2 – A heat flux that will ignite buildings after a prolonged period (30-60 minutes).

CAN FIRE BE EXTINGUISHED?

- ***"Senior Distrigas Official says even if a fire did occur, Fay's scenario overestimates its likely impact. By throwing water on an LNG fire within seconds, the tugboat escort could reduce a fire effects. He agrees that water could not extinguish the fire."*** **– Providence Journal 01/04/04**
- **However other sources disagree.**
  - *"Contact between water and pooled LNG should be avoided to prevent increased vaporization, unless vapor can be controlled."* - NFPA Handbook.
  - *"Water is ineffective in fighting LNG fire because it provides a heat source for vaporization".* (Which makes the fire and heat worse – my words) - Liquefied Natural Gas in California: History, Risks, and Siting
- **Any fire boat would be limited to protecting exposures several thousand feet away from large LNG pool fire.**

LNG STORAGE IN DORCHESTER

HAZARD ZONES FOR LAND BASED LNG FACILITY

COMMENTS ON HAZARD ZONES – "LAND BASED LNG"

- <u>Original Command Post</u> set up at a location on the opposite side of the expressway. It was assumed that 25 foot roadway would act as barrier for thermal radiation. – Actually, the flame height will be several hundred feet high so no protection actually existed.
- No provisions were originally made to evacuate the Yacht Club, which existed before plant was built so it was "grandfathered." If occupants, or plant staff, do not evacuate before total area of dike filled they will be trapped in a building that will eventually burn to the ground.
- Most other occupancies in the "defend in place" zone.

CONSEQUENCE MANAGEMENT (1)

- Any plan must be able to be implemented within minutes, since pool fire will reach maximum size in that time frame.
- Initial response of emergency responders may be away from incident to a safe staging area. Once extent and location of incident known action plan can be implemented.
- Set up Command Post, with multiple staging areas outside Sandia's Zone 2 circumference. (1.6KM)
- Anticipate the need to fight conflagration on both sides of harbor.

CONSEQUENCE MANAGEMENT (2)

- **Initially there will probably only be enough resources to evacuate selective populations. <u>Area must be "triaged"</u>.**
  - Area One (0 – 0.5Km)– Heat flux (37.5kw/M^2) too great for FD to operate and buildings will burn due to radiant heat from pool fire. – "Occupants should be told to attempt to shelter in basements, parking garages etc.?" (Even sprinklered buildings will burn due to water supply being inadequate.) – *LOW PRIORITY*
  - Area Two (0.5Km – 1.0Km) – Heat flux dangerous for short exposures, even with bunker gear. Buildings are in danger of burning from secondary thermal radiation hazard – Attempt to evacuate population using as much shielding as possible. – *HIGH PRIORITY*
  - Area Three (1.0Km – 1.5Km)– Buildings unlikely to burn burn but heat flux still hazardous to humans. Bunker gear should allow short term operations. – "Shelter in place". – *MODERATE PRIORITY*
  - Area Four (>1.5Km) – Heat Flux Low (5kW/m^2) Safe area, location of Command Post. - *LOW PRIORITY*
  - Distance estimates can be modified based on reports from field.
- **Once pool fire burns out, in 30-60 minutes, prepare to deal with secondary exposure fires.**

RISK VS. HAZARD

- **Govt and industry officials often claim that the risk is small. What they mean is that even though the hazardous consequences of an event are catastrophic, they assume that the probability of an event is small so the resultant risk is small. Example from "Golden Pass LNG" website: "Overall, the draft EIS is very favorable. The report shows the facility would have limited impact on the environment and a <u>low risk for accidents</u>.".**
- **Notice that the speaker uses the terms *"risk"* and *"accidents"*. They allow him to ignore the hazard of intentional acts while seeming to make it seem safe.**
- **The public does not understand the difference between risk and hazard. They assume that when someone says the risk is small that what they mean is that the hazard is small.**

RISK VS. HAZARD

- Whenever someone says the risk is small, ask the following:
  1. Do they mean that the probability of an event is small and the hazardous consequences are small?
  2. Do they mean that the probability of an event is small but the hazardous consequences are big?
  3. Do they mean that the probability of an event is high but the hazardous consequences are small?
- These three different scenarios could all produce a small risk but they mean very different things to the public. In any case, how does one calculate the probability of a terrorist attack and if you cannot then how can one say the risk from a terrorist attack is small?

INDUSTRY ATTEMPTS TO CORRECT LNG "MYTHS"

- "Assessing risks from tankers" by Richard Grant, President and CEO of Tractabel LNG North America. (Editorial in Boston Globe.)
  - *"LNG CANNOT EXPLODE. IN FACT, IN ITS LIQUID STATE AT MINUS 260 DEGREES, IT CANNOT EVEN BURN."*
- Both of these statements are true. Unfortunately neither of them is relevant. Stating that LNG will not explode gives the impression that it is not hazardous. The hazard of an LNG vessel incident would derive, not from an explosion, but from a pool fire or a vapor cloud ignition. The original EIS for the Everett Facility, estimated the potential fatalities from these two incidents at 3,000 and 2,500 respectively.

TESTIMONY FROM BOSTON CITY COUNCIL HEARING 11/06

- Chief Fleming – *"As of 11/06, there has not been a "<u>consequence mitigation analysis</u>" that would help BFD be prepared for LNG incident in Harbor."*
- Industry Expert – *"Chief Fleming was wrong. There was a <u>risk assessment</u>, which I participated in in 1975 as part of USCG EIS report for the Distrigas Facility."*
- Question by Councilor: *"Were there any fatality estimates, in the hundreds, as part of that risk assessment?"*
- Industry Expert: *"No, nothing like that."*
- <u>Truth – 1975 EIS estimates were 2,500-3,00 fatalities</u>.

TESTIMONY FROM BOSTON CITY COUNCIL HEARING 11/06

- Councilor: *"Is there any report that could be used to help the BFD prepare for an event?"*
- Industry Expert: *"If a large spill was to occur and ignite, the total duration would be 10 minutes. This is about the same as the FD's response to a building fire."* (The BFD response est. is 1-2 minutes. - JMF)
- Industry Expert: *"<u>Mitigation is impractical.</u> All eggs should be put in "prevention basket"."*
- *When discussing the Benham Gas Explosion, Houston 1992, Paul Gruhn advised the following. "<u>Putting all your eggs in one basket is never a good idea.</u> Providing adequate independent safety layers means when one system fails, <u>which it inevitably will</u>, another will be able to prevent the hazardous event.*

RESEARCH NEEDS - GAO 02/07

1. Large fire phenomena*
2. Cascading failure
3. Large-scale spill testing on water*
4. Large – scale fire testing*
5. Modeling: interaction of physical processes
6. Risk tolerability assessments
7. Vulnerability of containment systems (hole size)
8. Mitigation techniques
9. Effect of sea water coming in as LNG flows out
10. Impact of wind, weather, and waves

* *Only research needs funded in new DOE study.*

<u>Most items raised as issues by BFD over 5 years ago.</u>

FINAL THOUGHTS

- When communication risk information to the public, explain in it in terms of consequences and probability. This makes the “risk vs. hazard” issues transparent.
- USCG Circular NCV05 should be applied to all LNG facilities, including existing facilities. <u>(Similar policies should be developed for LPG, gasoline etc.)</u>
- Sandia recommendations should be followed. Particularly in terms of assessing local capabilities.
- Heat flux guidelines should take into account thermal radiation level that prevents FF activity. (Express consequences in terms of damage to people and property not “heat flux lines”.)
- Any report should be peer reviewed by independent 3rd party, at the expense of facility, who answer local concerns. (Similar language in Mass Building Code.)

Are natural gas ships 'boat bombs' for terror?

Boston at forefront of national trend for more LNG

Michael Dwyer / AP
The liquefied natural gas tanker Inigo Tapias makes its way through Boston Harbor on Jan. 24. Every few days, tankers like this one carry 33 million gallons of liquefied natural gas to a nearby plant.

By Karen Testa
Associated Press
2/16/2004

BOSTON — State Marine Patrol Sgt. John Reilly paused briefly as his 27-foot Boston Whaler bobbed in the choppy waters of Boston Harbor and considered the ship he was helping to protect.

At 930 feet long, the Inigo Tapias is one of the largest ships to do business in the harbor. Stood on end, it would dwarf the city's tallest building, the 750-foot John Hancock tower. And its cargo is certainly the most menacing.

Every few days, tankers like this one carry 33 million gallons of liquefied natural gas to a plant in Everett. They pass within a few hundred yards of downtown Boston and Logan Airport, where terrorists hijacked two planes and torpedoed them into the World Trade Center.

Safety armada for each ship

With Sept. 11, 2001, in mind, the Coast Guard coordinates an armada of protection for each trip — a helicopter, police divers, marine patrol, environmental police, firefighting tugs, city police boats, Coast Guard vessels. The Tobin Bridge, a major commuter pass, is closed as the tankers move below its 135-foot-high span.

Sgt. John Reilly of Massachusetts' Marine Patrol works escort duty for the Inigo Tapias, seen behind him at right.

"I've seen it come in I don't know how many times since Sept. 11 — 100 times — and every time it just kind of amazes you. Just the sheer size of it," Reilly said as the tanker made its way under the bridge.

Heightened fears of terrorism and a recent surge in proposals to build dozens of gas terminals around the United States have raised questions about whether they're too dangerous for metropolitan areas. Boston is currently one of just four ports in the continental United States to receive liquefied natural gas by ship, and the only one in a commercial and residential hub.

Liquefied natural gas, or LNG, is natural gas in a liquid form that has been cooled to minus-259 degrees. The liquid is warmed and turned to gas, which is used for heating and cooking as well as electricity generation. LNG imports account for only about 1 percent of the U.S. gas supply, but Federal Reserve Chairman Alan Greenspan has advocated expanding imports to ease energy prices.

Boston route since 1971

Ships carrying the fuel contain energy much more concentrated than crude oil — a fact not lost on the industry, or those who warn about the dangers of transporting it, or those who live and work nearby, although the ships have been taking this same route since 1971 without a fatal incident.

"Every day you're thinking about it. It's very, very dangerous," Anthony Pinto, of East Boston, said as pointed his cane across the harbor, down the Mystic River, past the Tobin Bridge to the dock for Distrigas, the company that runs the area's LNG facility.

Some studies say an attack by a missile or boat bomb on a tanker could spill half the cargo over the water, causing a catastrophic, searingly hot fire that would burn people and buildings a half-mile away. But a study paid for by the industry and used by the Coast Guard in approving a safety plan for Boston found the burn zone would be contained to a much smaller area. Not only would it be immediately doused with water from the tug boats, but the ship's design would protect more of the cargo from spilling, according to the study.

As pressure mounts to build more terminals to supplement the nation's shrinking supply of natural gas, U.S. Energy Secretary Spencer Abraham has asked Sandia National Laboratory to study LNG safety issues, particularly transportation.

The industry maintains it has established rigorous safety standards in cooperation with the Coast Guard.

Frank Katulak, senior vice president of operations for Distrigas, said some concerns arise from misconceptions about a relatively new form of fuel for this country.

“We had a higher profile than perhaps we would like, I think mostly because our ships are visible to people. They see them and they’re so large and they say, ’Is this some type of a risk?'" Katulak said.

Mayor wants ships out

Boston Mayor Thomas Menino wants to take no chances. He sued to keep LNG tankers out of the harbor after Sept. 11 — even after the Coast Guard said they could safely transit. He lost that fight but maintains they should not be coming into a metropolitan area.

The three other continental U.S. ports that receive LNG by ship are Lake Charles, La.; Cove Point, Md.; and Elba Island, Ga.

Massachusetts State Police officers prepare for LNG tanker escort duty.

James Fay, a professor emeritus of mechanical engineering at the Massachusetts Institute of Technology, is a leading expert on liquefied natural gas and former chairman of the Massachusetts Port Authority board. He believes a boat bomb, like the one used against the USS Cole in 2000 would cause at least half of the ship’s cargo to seep over the water and ignite in a raging blaze.

“There’s no doubt that with a big enough bomb you can blow a hole in the side of the vessel and the cargo will burn,” Fay said. “It’s well understood that for the big fires we’re talking about that distances like half a mile or so, you can get second-degree burns to exposed skin in about 30 seconds.”

Those in the LNG industry said Fay overestimates the potential damage because LNG carriers are doubled-hulled and have other protections around the tanks, making them stronger than ships such as the Cole.

Katulak said Fay exaggerated the likely impact of a fire. Still, while Katulak acknowledged LNG “has certain inherent hazards,” he added, “we’ve been frustrated there’s been a lack of perspective.”

Worst fatalities in 1944

The only fatalities due to LNG have occurred on land. The most serious accident was in Cleveland in 1944 outside an LNG-storage facility. LNG escaped from a faulty tank, forming a vapor cloud that seeped into surrounding streets and sewers then ignited, killing 128 people.

Jerry Havens, a University of Arkansas professor and expert in both fires and weapons of mass destruction, said he agrees with Fay's assessments. Both he and Fay recognize LNG as a valuable resource — but one with risks.

"I for one believe that serious consideration should be given on a site-by-site basis to whether or not the risk since 9-11 is sufficient to cause increased reason to take it offshore or put it someplace else," Havens said.

Boston

Safe Harbor?

Ships bringing liquefied natural gas from the Middle East pass regularly through Boston Harbor. Experts say there's little chance of an LNG tanker going up in a fireball. Then why are city officials so worried? Should you be?

By Jason Schwartz | Boston Magazine | July 2010

AT 2:30 A.M. ON A TUESDAY IN MAY, a 53-foot pilot boat called the *Mystic* motored out to just beyond Boston Harbor and came alongside the GDF *Suez Neptune*. Like all ships entering the harbor, the *Neptune* — 928 feet long and 141 feet wide — required a licensed Boston Harbor pilot on the bridge, and Frank Morton was on the job. Stepping to the edge of the *Mystic*'s bow, he reached for the rope ladder that dangled from the *Neptune* like something on a pirate ship, then clambered up the side and onto the state-of-the-art tanker.

As he directed the ship into the harbor, blue lights whirred in every direction: on law-enforcement escort boats, on police cruisers parked at the end of nearly every pier. A chopper hovered as the tanker sailed past the airport, past downtown, and up the Mystic River. The security detail was a spectacular acknowledgment of the ship's cargo: 38 million gallons of liquefied natural gas, or LNG, enough fuel to power a region or, in the wrong hands and under the right conditions, incinerate half a city.

LNG tankers have been controversial ever since they started steaming through Boston Harbor to port in Everett in 1971, but became even more so after 9/11. If terrorists caused even 10 percent of the typical LNG tanker's payload to spill and ignite, the resulting fire could be calamitous, according to a 2004 report by Sandia National Laboratories for the U.S. Department of Energy. The study didn't publicly estimate casualties for Boston; in fact, no study has since 1977, when the Federal Energy Regulatory Commission estimated that up to 3,000 would die. Today, when the city's population of 610,000 swells to more than one million on workdays, the number could be higher. It's not hard to imagine why Boston remains the country's only major city with an LNG terminal.

The tankers were such cause for concern after 9/11, Mayor Thomas Menino asked a federal judge to ban them from the city. The effort failed, and the LNG debate faded — until this past February, when shipments started arriving from Yemen, a known terrorist haven and site of the 2000 attack on the USS *Cole*. “This is serious stuff,” Menino says. “I take it very seriously, and my public-safety officials take it very seriously. We don’t have the equipment to put down an explosion of an LNG tank. They say, ‘Well, it will never happen.’ Well, 9/11 hadn’t happened either. We live in a different era.”

For nearly a decade, Menino has been urging the federal government to develop more natural-gas pipelines and offshore LNG terminals for New England — an expensive solution to what has been, so far, a hypothetical problem. Executives of Distrigas, a subsidiary of French conglomerate GDF Suez, which owns the Everett terminal, counter that security is better than ever, and point to their industry’s sterling safety record: There hasn’t been a serious incident since an LNG storage tank exploded in Cleveland in 1944, destroying 79 homes and two factories, and killing 130 people.

Still, even ships coming from countries more stable than Yemen are scrutinized. The *Neptune*, for instance, had sailed from Trinidad. Just before dawn it reached Everett safely, like the nearly 1,000 ships before it.

Yet some LNG experts, like University of Arkansas chemical engineering professor Jerry Havens, point out that something need go wrong only once. “Moving this much flammable fuel through a populated area should be considered...low risk, low probability, but high consequence,” he says.

Note:

The Federal Government has defined LNG ship Hazard Zones that extend 2.2-miles from the ship. The hazards within those zones include cryogenic burns, asphyxiation, fire, thermal-radiation burns, and explosion.

SANDIA REPORT

SAND2004-6258
Unlimited Release
Printed December 2004

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Mike Hightower, Louis Gritzo, Anay Luketa-Hanlin, John Covan, Sheldon Tieszen, Gerry Wellman, Mike Irwin, Mike Kaneshige, Brian Melof, Charles Morrow, Don Ragland

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Sandia is a multiprogram laboratory operated by Sandia Corporation,
a Lockheed Martin Company, for the United States Department of Energy's
National Nuclear Security Administration under Contract DE-AC04-94AL85000.

Sandia National Laboratories

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SAND2004-6258
Unlimited Release

Printed December 2004

Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water

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Abstract

While recognized standards exist for the systematic safety analysis of potential spills or releases from LNG (Liquefied Natural Gas) storage terminals and facilities on land, no equivalent set of standards or guidance exists for the evaluation of the safety or consequences from LNG spills over water. Heightened security awareness and energy surety issues have increased industry's and the public's attention to these activities. The report reviews several existing studies of LNG spills with respect to their assumptions, inputs, models, and experimental data. Based on this review and further analysis, the report provides guidance on the appropriateness of models, assumptions, and risk management to address public safety and property relative to a potential LNG spill over water.

ACKNOWLEDGEMENT

The authors received technical, programmatic, and editorial support on this project from a number of individuals and organizations both inside and outside Sandia National Laboratories. We would particularly like to express our thanks for their support and guidance in the technical evaluations and development of this report.

The U.S. Department of Energy was instrumental in providing coordination, management, and technical direction. Special thanks go to DOE personnel in the Office of Oil and Natural Gas, DOE Office of Fossil Energy, for their help in supporting the modeling, analysis, technical evaluations, and risk guidance efforts.

To support the technical analysis required for this project, the authors worked with many organizations, including maritime agencies, LNG industry and ship management agencies, LNG shipping consultants, and government intelligence agencies to collect the background information on ship and LNG cargo tank designs, accident and threat scenarios, and LNG ship safety and risk management operations needed to assess LNG spill safety and risk implications.

The following individuals were especially helpful in supporting our efforts, providing information, coordinating contacts, and reviewing technical evaluations.

Capt. Dave Scott – U.S. Coast Guard
Dr. Robin Pitblado – Det Norske Veritas
Eric Linsner – PRONAV Ship Management
Mike Edens – Office of Naval Intelligence
Richard Hoffmann – Federal Energy Regulatory Commission
Chris Zerby – Federal Energy Regulatory Commission

To help in technically reviewing this report, the DOE commissioned an External Peer Review Panel to evaluate the analyses, conclusions, and recommendations presented. The Peer Review Panel consisted of experts in LNG spill testing and modeling, fire modeling, fire protection, and fire safety and risk management. The panel's comments and suggestions were extremely valuable in improving the technical presentation and organization of the report. The authors would like to thank the following members of the External Peer Review Panel for their valuable comments, suggestions, and directions.

Dr. Paul Croce – Vice President and Manager of Research, FM Global
Dr. Carlos Fernandez-Pello – Professor of Fire Sciences, University of California Berkeley
Dr. Ron Koopman – Consultant on LNG spills and modeling
Dr. Fred Mowrer – Associate Professor of Fire Protection Engineering, University of Maryland

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SYMBOLS AND ACRONYMS

<	less than
>	greater than
/	per
°C	degrees Celsius
°F	degrees Fahrenheit
°K	degrees Kelvin
g	gram
k	kilo- (multiplied 1000 times; e.g. 5 kW = 5000 watts)
knot	nautical mile per hour (1 knot = 1.15 miles per hour)
m	meter (1 m = 39.37 inches)
m^2	meter squared (an area measuring one meter on each side)
m (as a prefix)	milli- (1/1000; e.g., 1 mm = 1/1000 of a meter)
s	second
Tcf	Trillion cubic feet
W	Watt
(CFD) Computational Fluid Dynamics	a modern analysis technique using computer technology to numerically solve the complete nonlinear partial differential equations governing complex fluid flows
Credible event	a group (or groups) could have the general means and technical skill to accomplish successfully an intentional breach.
(LFL) Lower Flammability Limit	lowest concentration of a fuel by volume mixed with air that is flammable
(LNG) Liquefied Natural Gas	natural gas that has been cooled to a temperature such that the natural gas becomes a liquid
Nominal Case	expected outcomes of a potential breach and associated thermal hazards based on an assessment of identified credible threats and the use of best available data to select model input parameters
(RPT) Rapid Phase Transitions	the rapid evaporation of a liquid resulting from contact with another liquid that is at a temperature significantly above the boiling temperature of the evaporating liquid
(UFL) Upper Flammability Limit	highest concentration of a fuel by volume mixed with air that is flammable
Validation	comparison of analytical results from a model with experimental data to ensure that the physical bases and assumptions of the model are appropriate and produce accurate results

FOREWORD

The Energy Information Administration (EIA) estimates that domestic natural gas production is expected to increase more slowly than consumption, rising to 20.5 trillion cubic feet (Tcf) in 2010 and 21.9 Tcf in 2025. Domestic gas production is relatively flat, while the marginal costs of domestic production are increasing, which has caused a fundamental shift in long-term gas prices. At the same time, gas demand is rising sharply, particularly for electric power generation. The National Petroleum Council (NPC) states in its recent report, "*Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy,"* that "traditional North American producing areas will provide 75% of long-term U.S. gas needs, but will be unable to meet projected demand," and that … "New, large-scale resources such as LNG and Arctic gas are available and could meet 20%-25% of demand, but are higher-cost and have long lead times."

The combination of higher natural gas prices, rising natural gas demand, and lower liquefied natural gas (LNG) production costs, is setting the stage for increased LNG trade in the years ahead. Estimates are that worldwide LNG trade will increase 35 percent by 2020. In the United States, EIA projects that natural gas imports will more than double over the next 20 years. Nearly all the projected increase is expected to come from LNG, requiring an almost 28-fold increase in LNG imports over 2002 levels.

The United States currently has four marine LNG import terminals: Lake Charles, Louisiana; Everett, Massachusetts; Elba Island, Georgia; and Cove Point, Maryland. EIA projects that three new LNG terminals could be constructed in the U.S. in the next 4 to 5 years, and others have estimated that as many as eight could be constructed within this time frame. More than 40 new marine LNG terminal sites are under consideration and investigation. A major factor in the siting of LNG import terminals is their proximity to a market, enabling natural gas to be easily supplied to areas where there is a high demand, but limited domestic supplies. For this reason, marine LNG import terminals are being proposed or considered near major population centers on all three U.S. coasts.

For more information on North American natural gas supply and demand, please refer to the latest *Annual Energy Outlook* of the Energy Information Administration (EIA). The EIA (www.eia.doe.gov) is the statistical agency of the Department of Energy. It provides policy-independent data, forecasts, and analyses to promote sound policy-making, efficient markets, and public understanding regarding energy and its interaction with the economy and environment. Also useful is the National Petroleum Council (NPC) report, *Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy* (www.npc.org). This multi-volume report was prepared in response to a request from the Secretary of Energy for a new study on natural gas markets in the 21st century, to update the NPC's 1992 and 1999 reports on the subject. It provides insights on energy market dynamics, as well as advice on actions that can be taken by industry and Government to ensure adequate and reliable supplies of energy for customers.

1 EXECUTIVE SUMMARY

The increasing demand for natural gas in the U.S. could significantly increase the number and frequency of marine LNG imports. While many studies have been conducted to assess the consequences and risks of potential LNG spills, the increasing importance of LNG imports suggests that consistent methods and approaches be identified and implemented to help ensure protection of public safety and property from a potential LNG spill.

For that reason, the U.S. Department of Energy (DOE), Office of Fossil Energy, requested that Sandia National Laboratories (Sandia) develop guidance on a risk-based analysis approach to assess and quantify potential threats to an LNG ship, the potential hazards and consequences of a large spill from an LNG ship, and review prevention and mitigation strategies that could be implemented to reduce both the potential for and the risks of an LNG spill over water. Specifically, DOE requested:

- An in-depth literature search of the experimental and technical studies associated with evaluating the safety and hazards of an LNG spill from an LNG cargo tank ship;
- A detailed review of four recent spill modeling studies related to the safety implications of a large-scale LNG spill over water;
- Evaluation of the potential for breaching an LNG ship cargo tank, both accidentally and intentionally, identification of the potential for such breaches and the potential size of an LNG spill for each breach scenario, and an assessment of the potential range of hazards involved in an LNG spill; and
- Development of guidance on a risk-based approach to analyze and manage the threats, hazards, and consequences of an LNG spill over water to reduce the overall risks of an LNG spill to levels that are protective of public safety and property.

To support this effort, Sandia worked with the U.S. DOE, the U.S. Coast Guard, LNG industry and ship management agencies, LNG shipping consultants, and government intelligence agencies to collect background information on ship and LNG cargo tank designs, accident and threat scenarios, and standard LNG ship safety and risk management operations. The information gathered was used to develop accidental and intentional LNG cargo tank breach scenarios, for modeling of potential spill hazards, and as the basis for analysis to determine the extent and severity of LNG spill consequences. Based on analysis of the modeling results, three consequence-based hazard zones were identified plus. In addition, risk reduction and mitigation techniques were identified to reduce impacts on public safety and property.

Several conclusions and recommendations were developed based on these results. The key conclusions are listed below.

Key Conclusions

1. The system-level, risk-based guidance developed in this report, though general in nature (non site-specific), can be applied as a baseline process for evaluating LNG operations where there is the potential for LNG spills over water.

2. A review of four recent LNG studies showed a broad range of results, due to variations in models, approaches, and assumptions. The four studies are not consistent and focus only on consequences rather than both risks and consequences. While consequence studies are important, they should be used to support comprehensive, risk-based management and planning approaches for identifying, preventing, and mitigating hazards to public safety and property from potential LNG spills.

3. Risks from accidental LNG spills, such as from collisions and groundings, are small and manageable with current safety policies and practices.

4. Risks from intentional events, such as terrorist acts, can be significantly reduced with appropriate security, planning, prevention, and mitigation.

5. This report includes a general analysis for a range of intentional attacks. The consequences from an intentional breach can be more severe than those from accidental breaches. Multiple techniques exist to enhance LNG spill safety and security management and to reduce the potential of a large LNG spill due to intentional threats. If effectively implemented, these techniques could significantly reduce the potential for an intentional LNG spill.

6. Management approaches to reduce risks to public safety and property from LNG spills include operation and safety management, improved modeling and analysis, improvements in ship and security system inspections, establishment and maintenance of safety zones , and advances in future LNG off-loading technologies. If effectively implemented, these elements could reduce significantly the potential risks from an LNG spill.

7. Risk identification and risk management processes should be conducted in cooperation with appropriate stakeholders, including public safety officials and elected public officials. Considerations should include site-specific conditions, available intelligence, threat assessments, safety and security operations, and available resources.

8. While there are limitations in existing data and current modeling capabilities for analyzing LNG spills over water, existing tools, if applied as identified in the guidance sections of this report, can be used to identify and mitigate hazards to protect both public safety and property. Factors that should be considered in applying appropriate models to a specific problem include: model documentation and support, assumptions and limitations, comparison with data, change control and upgrade information, user support, appropriate modeling of the physics of a spill, modeling of the influence of environmental conditions, spill and fire dynamics, and peer review of models used for various applications. As more LNG spill testing data are obtained and modeling capabilities are improved, those advancements can be incorporated into future risk analyses.

9. Where analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain or structures can occur, modern, validated computational fluid dynamics (CFD) models can be used to improve analysis of site-specific hazards, consequences, and risks.

10. LNG cargo tank hole sizes for most credible threats range from two to twelve square meters; expected sizes for intentional threats are nominally five square meters.

11. The most significant impacts to public safety and property exist within approximately 500 m of a spill, due to thermal hazards from fires, with lower public health and safety impacts at distances beyond approximately 1600 m.

12. Large, unignited LNG vapor releases are unlikely. If they do not ignite, vapor clouds could spread over distances greater than 1600 m from a spill. For nominal accidental spills, the resulting hazard ranges could extend up to 1700 m. For a nominal intentional spill, the hazard range could extend to 2500 m. The actual hazard distances will depend on breach and spill size, site-specific conditions, and environmental conditions.

13. Cascading damage (multiple cargo tank failures) due to brittle fracture from exposure to cryogenic liquid or fire-induced damage to foam insulation was considered. Such releases were evaluated and, while possible under certain conditions, are not likely to involve more than two or three cargo tanks for any single incident. Cascading events were analyzed and are not expected to greatly increase (not more than 20%-30%) the overall fire size or hazard ranges noted in Conclusion 11 above, but will increase the expected fire duration.

1.1 Safety Analysis and Risk Management of Large LNG Spills over Water

In modern risk analysis approaches, the risks associated with an event are commonly defined as a function of the following four elements:

- The probability of the event — such as an LNG cargo tank breach and spill;
- The hazards associated with the event — such as thermal radiation from a fire due to an LNG spill;
- The consequences of the event — such as the thermal damage from a fire, and
- The effectiveness of systems for preventing the event or mitigating hazards and consequences — such as any safety/security systems.

1.1.1 LNG Spill Prevention and Mitigation

Risks from a potential LNG spill over water could be reduced through a combination of approaches, including 1) reducing the potential for a spill, 2) reducing the consequences of a spill, or 3) improving LNG transportation safety equipment, security, or operations to prevent or mitigate a spill.

For example, a number of international and U.S. safety and design standards have been developed for LNG ships to prevent or mitigate an accidental LNG spill over water. These standards are designed to prevent groundings, collisions, and steering or propulsion failures. They include traffic control, safety zones around the vessel while in transit within a port, escort by Coast Guard vessels, and coordination with local law enforcement and public safety agencies. In addition, since September 11, 2001, further security measures have been implemented to reduce the potential for intentional LNG spills over water. They include earlier notice of a ship's arrival (from 24 hours to 96 hours), investigation of crew backgrounds, at-sea boardings of LNG ships and special security sweeps, and positive control of an LNG ship during port transit.

Proactive risk management approaches can reduce both the potential for and hazards of such events. These are discussed in Section 6 of this report, and include:

- Improvements in ship and terminal safety/security systems,
- Modifications and improvements in LNG tanker escorts, vessel movement control zones, and safety operations near ports and terminals,
- Improved surveillance and searches,
- Redundant or offshore mooring and offloading systems, and
- Improved emergency response coordination and communications.

Risk prevention and mitigation techniques can be important tools in reducing both the potential for and the hazards of a spill, especially in zones where the potential impact on public safety and property can be high. However, what might be applicable for effective risk reduction in one location might not be appropriate at another. The options identified in Table 1 provide examples of how implementation of different strategies, alone or in combination, can be used to reduce certain threats, mitigate consequences of a spill, or reduce hazard analysis uncertainties.

Table 1: Representative Options for LNG Spill Risk Reduction

IMPACT ON PUBLIC SAFETY	REDUCTION IN EVENT POTENTIAL (Prevention)	IMPROVE SYSTEM SECURITY AND SAFETY (Mitigation)	IMPROVED HAZARD ANALYSIS (Reduce Analytical Uncertainties)	RESULTANT RISK REDUCTION
High and Medium	▪ Early off-shore interdiction ▪ Ship inspection ▪ Control of ship, tug and other vessel escorts ▪ Vessel movement control zones (safety/security zones) ▪ One-way traffic ▪ LNG offloading system security interlocks	▪ Harbor pilots ▪ Ship and terminal safety and security upgrades ▪ Expanded emergency response and fire fighting to address fires, vapor clouds, and damaged vessels	▪ Use of validated CFD models for LNG spill and thermal consequence analysis for site specific conditions ▪ Use of CFD and structural dynamic models for spill/structure interactions	Combination of approaches to reduce risks to acceptable levels
Low	Use of existing best risk management practices on traffic control, monitoring & safety zones	Use of existing best risk mitigation practices to ensure risks remain low	Use of appropriate models to ensure hazards are low for site-specific conditions	Combination of approaches to ensure risks are maintained at acceptable levels

To help reduce the risks to public safety and property from both accidental and intentional events, this report provides guidance on risk-based approaches for analyzing and managing the threats, hazards, and consequences of an LNG spill over water. The guidance is summarized in the remainder of the Executive Summary and presented in detail in Sections 3 – 6 of this report and in technical discussions in Appendices A – D.

1.1.2 LNG Breach, Spill, and Hazard Analyses

Currently, the potential for an LNG cargo tank breach, whether accidental or intentional, the dynamics and dispersion of a large spill, and the hazards of such a spill, are not fully understood, for two primary reasons. First, the combination of current LNG ship designs and safety management practices for LNG transportation have reduced LNG accidents to the extent that

there is little historical or empirical information on the consequences of breaches or large spills. Second, existing experimental data on LNG spill dynamics and its dispersion over water address spill sizes that are more than a factor of one hundred smaller than spill sizes currently being postulated for some intentional events. Variations in site conditions, LNG ship designs, and environmental conditions further complicate hazard predictions.

The lack of large-scale experimental data forces analysts to make many assumptions and simplifications in calculating the breach of an LNG cargo tank, the resulting spill dispersion, and associated thermal hazards. For example, an evaluation of four recent LNG spill studies (Appendix A) showed significant differences in thermal hazard estimates due to the differences in assumptions and modeling approaches used in each analysis.

Although existing spill assessment and modeling techniques and validation of models against large-scale LNG spill data have limitations, the guidance provided in this report is applicable to performance-based hazard and risk management approaches. Such approaches can be used in conjunction with existing spill and hazard analysis techniques, and safety and security methods, to assess and reduce the risks to both public safety and property caused by an LNG spill over water. Guidance is provided on the use of existing analysis techniques applied to site-specific conditions for increasing confidence in the management of hazards and risks. As additional LNG spill data are obtained and hazard analysis models are improved, they can be incorporated into future risk analysis guidance.

LNG Cargo Tank Breach Analysis

Based on available information, a range of historically credible and potential accidental and intentional events was identified that could cause an LNG cargo tank breach and spill. Modern finite element modeling and explosive shock physics modeling were used to estimate a range of breach sizes for credible accidental and intentional LNG spill events, respectively. The results are discussed in Sections 4 and 5 and detailed in Appendix B.

From these analyses, the sizes of LNG cargo tank breaches for accidents were estimated to be less than 2 m^2. For intentional events, the size of the hole depends on its location on the ship and the source of the threat. Intentional breaches were estimated at 2 to approx. 12 m^2, with nominal sizes of about 5 – 7 m^2. These sizes are smaller than those used in many recent studies. Although smaller, the breach sizes estimated can still lead to large LNG spills.

Using structural fracture mechanics analyses, the potential for cryogenic damage to the LNG ship and other LNG cargo tanks was also evaluated, as discussed in Sections 4 and 5 and Appendix D. Based on these analyses, the potential for cryogenic damage to the ship cannot be ruled out, especially for large spills. The degree and severity of damage depends on the size and location of the breach. Sandia considered cryogenic damage to the ship's structure and concluded that releases from no more than two or three tanks would be involved in a spill that occurs due to any single incident. This cascading release of LNG was analyzed and is not expected to increase significantly the overall fire size or hazard ranges, but the expected fire duration will increase. Hazard analysis and risk prevention and mitigation strategies should consider this in assessing public safety and damage to property.

Spill and Dispersion Analysis

The variability in existing LNG spill and dispersion/thermal hazard modeling approaches is due to physical limitations in the models and the lack of validation with large-scale spill data. Obtaining experimental data for large LNG spills over water would provide needed validation and help reduce modeling uncertainty. Because extrapolation of existing models will be necessary for analysis of potentially large spills, models should be used that invoke as much fundamental physics as possible. Based on the evaluations presented in Sections 4 and 5 and Appendices C and D, several types of models currently exist to assess hazards. Models should be used only where they are appropriate and understood to ensure that the results increase confidence in the analysis of the hazards and risks to public safety and property.

In higher hazard zones, where analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain or structures can occur, modern, CFD models, as listed in Table 2, can be used to improve analysis of site-specific hazards, consequences, and risks. Use of these models is suggested because many of the simpler models have limitations that can cause greater uncertainties in calculating liquid spread, vapor dispersion, and fire hazards. CFD models have their own limitations and should be validated prior to use. Further refinement of CFD models will continue to improve the degree of accuracy and reliability for consequence modeling.

Table 2: Models for Improved Analysis of an LNG Spill in High Hazard Areas

APPLICATION	IMPROVED MODELING APPROACHES
Breach Analysis	Finite element codes for modeling accidental ship collisions & shock physics codes for modeling intentional breaches.
Tank Emptying	Modified orifice model that includes the potential for LNG leakage between hulls.
Structural Damage Modeling	Coupled spill leakage, fluid flow, and fracture mechanics codes for modeling ship structural damage & damage to LNG cargo tanks.
Spreading	CFD codes for modeling spread of cryogenic liquids on water.
Dispersion	CFD codes for modeling dispersion of dense gases.
Fire	CFD codes for modeling fire phenomena, including combustion, soot formation, and radiative heat transfer.

While these studies provide insight into appropriate models to use, additional factors should be considered in applying models to a specific problem. These include model documentation and support, assumptions and limitations, comparison and validation with data, change control and upgrade information, user support, appropriate modeling of the physics of a spill, modeling of the influence of environmental conditions, spill and fire dynamics, and model peer review.

Hazards Analysis and Public Safety Impacts

Current LNG spill and dispersion modeling and analysis techniques have limitations. In addition, variations exist in location-specific conditions that influence dispersion, such as terrain, weather conditions, waves, currents, and the presence of obstacles. Therefore, it is sensible to provide guidance on the general range of hazards for potential spills rather than suggest a specific, maximum hazard guideline.

To assess the general magnitude of expected hazard levels, a limited sensitivity analysis was performed using simplified models for a range of spill volumes. The spill volumes were based on potential breaches from credible accidental and intentional threats. These analyses are

summarized in Sections 4 and 5 of this report. While not conducted for a specific site, the analyses provide examples of general considerations for hazards and risks. From the assessment conducted, thermal hazards will occur predominantly within 1600 m of an LNG ship spill, with the highest hazards generally in the near field (approximately 250 - 500 m of a spill). While thermal hazards can exist beyond 1600 m, they are generally lower in most cases.

The general hazard zones and safety guidance identified from this assessment are as follows:

- The pool sizes for the credible spills estimated could range from generally 150 m in diameter for a small, accidental spill to several hundred meters for a large, intentional spill. Therefore, high thermal hazards from a fire are expected to occur within approximately 250 – 500 m from the origin of the spill, depending on the size of the spill. Major injuries and significant structural damage are possible in this zone. The extent of the hazards will depend on the spill size and dispersion from wind, waves, and currents. People, major commercial/industrial areas or other critical infrastructure elements, such as chemical plants, refineries, bridges or tunnels, or national icons located within portions of this zone could be seriously affected.
- Hazards and thermal impacts transition to lower levels with increasing distance from the origin of the spill. Some potential for injuries and property damage can still occur in portions of this zone; but this will vary based on spill size, distance from the spill, and site-specific conditions. For small spills, the hazards transition quickly to lower hazard levels.
- Beyond approximately 750 m for small accidental spills and 1600 m for large spills, the impacts on public safety should generally be low for most potential spills. Hazards will vary; but minor injuries and minor property damage are most likely at these distances. Increased injuries and property damage would be possible if vapor dispersion occurred and a vapor cloud was not ignited until after reaching this distance.

Table 3 summarizes the results on expected hazard levels for several types of accidental and intentional spills. While the analyses included evaluations of the size and number of breaches, spill rate and discharge coefficient, burn rate, surface emissive power, and transmissivity, site-specific environmental conditions such as wind speed, direction, waves, and currents, were not specifically considered. Therefore, the distances to each of the different hazard zones are provided as guidance and will vary depending on site-specific conditions and location.

The upper part of Table 3 identifies the estimated hazard zones in terms of public safety from potential accidents, where spills are generally much smaller. The lower part of Table 3 identifies the estimated hazard zones in terms of public safety from examples of intentional LNG spills, which can be larger.

Table 3: Guidance for Impacts on Public Safety from LNG Breaches and Spills

EVENT	POTENTIAL SHIP DAMAGE AND SPILL	POTENTIAL HAZARD	POTENTIAL IMPACT ON PUBLIC SAFETY*		
			High	Medium	Low
Collisions: Low speed	Minor ship damage, no spill	Minor ship damage	None	None	None
Collisions: High Speed	LNG cargo tank breach and small - medium spill	Damage to ship and small fire	~ 250 m	~ 250 – 750 m	> 750 m
Grounding: <3 m high object	Minor ship damage, no breach	Minor ship damage	None	None	None
Intentional Breach	Intentional breach and medium to large spill	Damage to ship and large fire	~ 500 m	~ 500 m – 1600 m	> 1600 m
	Intentional, large release of LNG	• Damage to ship and large fire	~ 500m	~ 500 m – 1600 m	> 1600 m
		• Vapor cloud dispersion with late ignition	~ 500 m	> 1600 m	> 2000 m

[a] Distance to spill origin, varies according to site
Low – minor injuries and minor property damage
Medium – potential for injuries and property damage
High – major injuries and significant damage to property

Many of the hazard zones identified in Table 3 are based on thermal hazards from a pool fire, because many of the events will provide ignition sources such that a fire is likely to occur immediately. In some cases, the potential exists for a vapor cloud to be created without being ignited. As noted in Sections 4 and 5 and Appendices C and D, a vapor cloud from an LNG spill could extend to 2,500 m, if an ignition source is not available. The potential thermal hazards within a vapor cloud could be high. Because vapor cloud dispersion is highly influenced by atmospheric conditions, hazards from this type of event will be very site-specific.

In addition, latent or indirect effects, such as additional damage that could be caused by a damaged infrastructure (e.g. a refinery or power plant), were not directly assessed. These types of issues and concerns are site-specific and should be included as part of the overall risk management process.

1.2 Safety Analysis Conclusions

The potential for damage to LNG containment systems that could result from accidents or intentional events was evaluated. While hazard distances and levels will vary based on site-specific conditions, a summary of the safety analysis conclusions is presented below.

1.2.1 General Conclusions

1. The most significant impacts to public safety and property exist within approximately 500 m of a spill, with much lower impacts at distances beyond 1600 m, even for very large spills.
2. Under certain conditions, it is possible that multiple LNG cargo tanks could be breached as a result of the breaching event itself, as a consequence of LNG-induced cryogenic damage to nearby tanks, or from fire-induced structural damage to the vessel.
3. Multiple breach and cascading LNG cargo tank damage scenarios were analyzed, as discussed in Sections 4 and 5. While possible under certain conditions, they are likely to involve no more than two to three cargo tanks at any one time. These conditions will not greatly change the hazard ranges noted in General Conclusion Number 1, but will increase expected fire duration.

1.2.2 Accidental Breach Scenario Conclusions

1. Accidental LNG cargo tank damage scenarios exist that could potentially cause an effective breach area of 0.5 to 1.5 m^2.
2. Due to existing design and equipment requirements for LNG carriers, and the implementation of navigational safety measures such as traffic management schemes and safety zones, the risk from accidents is generally low.
3. The most significant impacts to public safety and property from an accidental spill exist within approximately 250 m of a spill, with lower impacts at distances beyond approximately 750 m from a spill.

1.2.3 Intentional Breach Scenario Conclusions

1. Several credible, intentional LNG cargo tank damage scenarios were identified that could initiate a breach of between 2 m^2 to approximately 12 m^2, with a probable nominal size of 5 – 7 m^2.
2. Most of the intentional damage scenarios identified produce an ignition source and an LNG fire is very likely to occur.
3. Some intentional damage scenarios could result in vapor cloud dispersion, with delayed ignition and a fire.
4. Several intentional damage scenarios could affect the structural integrity of the vessel or other LNG cargo tanks due to ignition of LNG vapor trapped within the vessel. While possible under certain conditions, these scenarios are likely to involve no more than two to three cargo tanks at any one time, as discussed in Sections 4 and 5.
5. Rapid phase transitions (RPT) are possible for large spills. Effects will be localized near the spill source and should not cause extensive structural damage.
6. The potential damage from spills to critical infrastructure elements such as bridges, tunnels, industrial/commercial centers, LNG unloading terminals and platforms, harbors, or populated areas can be significant in high hazard zones.

7. In general, the most significant impacts on public safety and property from an intentional spill exist within approximately 500 m of a spill, with lower impacts at distances beyond approximately 1600 m from a spill, even for very large spills.

1.3 Guidance on Risk Management for LNG Operations over Water

Risk identification and risk management processes should be conducted in cooperation with appropriate stakeholders, including public safety officials and elected public officials. Considerations should include site-specific conditions, available intelligence, threat assessments, safety and security operations, and available resources. This approach should be performance-based and include identification of hazards and risks, protection required for public safety and property, and risk prevention and mitigation strategies.

The following guidance is provided to assist risk management professionals, emergency management and public safety officials, port security officials and other appropriate stakeholders in developing and implementing risk management strategies and processes. For both accidental and intentional spills, the following is recommended:

- Use effective security and protection operations that include enhanced interdiction, detection, delay procedures, risk management procedures, and coordinated emergency response measures, which can reduce the risks from a breaching event;
- Implement risk management strategies based on site-specific conditions and the expected impact of a spill on public safety and property. Less intensive strategies would often be sufficient in areas where the impacts of a spill are low.
- Where analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain or structures can occur, modern, validated computational fluid dynamics (CFD) models can be used to improve analysis of site-specific hazards.

1.3.1 Guidance on Risk Management for Accidental LNG Spills

Zone 1

These are areas in which LNG shipments transit narrow harbors or channels, pass under major bridges or over tunnels, or come within approximately 250 meters of people and major infrastructure elements, such as military facilities, population and commercial centers, or national icons. Within this zone, the risk and consequences of an accidental LNG spill could be significant and have severe negative impacts. Thermal radiation poses a severe public safety and property hazard, and can damage or significantly disrupt critical infrastructure located in this area.

Risk management strategies for LNG operations should address both vapor dispersion and fire hazards. Therefore, the most rigorous deterrent measures, such as vessel security zones, waterway traffic management, and establishment of positive control over vessels are options to be considered as elements of the risk management process. Coordination among all port security stakeholders is essential. Incident management and emergency response measures should be

carefully evaluated to ensure adequate resources (i.e., firefighting, salvage, etc.) are available for consequence and risk mitigation.

Zone 2

These are areas in which LNG shipments and deliveries occur in broader channels or large outer harbors, or within approximately 250 m – 750 m of major critical infrastructure elements like population or commercial centers. Thermal radiation transitions to less severe hazard levels to public safety and property. Within Zone 2, the consequences of an accidental LNG spill are reduced and risk reduction and mitigation approaches and strategies can be less extensive.

Within Zone 2, the consequences of an accidental LNG spill are reduced and risk reduction and mitigation approaches and strategies can be less extensive. In this zone, risk management strategies for LNG operations should focus on approaches dealing with both vapor dispersion and fire hazards. The strategies should include incident management and emergency response measures such as ensuring areas of refuge (e.g. enclosed areas, buildings) are available, development of community warning signals, and community education programs to ensure persons know what precautions to take.

Zone 3

This zone covers LNG shipments and deliveries that occur more than approximately 750 m from major infrastructures, population/commercial centers, or in large bays or open water, where the risks and consequences to people and property of an accidental LNG spill over water are minimal. Thermal radiation poses minimal risks to public safety and property.

Within Zone 3, risk reduction and mitigation strategies can be significantly less complicated or extensive. Risk management strategies should concentrate on incident management and emergency response measures that are focused on dealing with vapor cloud dispersion. Measures should ensure areas of refuge are available, and community education programs should be implemented to ensure that persons know what to do in the unlikely event of a vapor cloud.

1.3.2 Guidance on Risk Management for Intentional LNG Spills

Zone 1

These are areas in which LNG shipments occur in narrow harbors or channels, pass under major bridges or over tunnels, or come within approximately 500 meters of major infrastructure elements, such as military facilities, population and commercial centers, or national icons. Within this zone, the risk and consequences of a large LNG spill could be significant and have severe negative impacts. Thermal radiation poses a severe public safety and property hazard, and can damage or significantly disrupt critical infrastructure located in this area.

Risk management strategies for LNG operations should address vapor dispersion and fire hazards. The most rigorous deterrent measures, such as vessel security zones, waterway traffic management, and establishment of positive control over vessels are elements of the risk management process. Coordination among all port security stakeholders is essential. Incident management and emergency response measures should be carefully evaluated to ensure adequate resources (i.e., firefighting, salvage) are available for consequence and risk mitigation.

Zone 2

These are areas in which LNG shipments and deliveries occur in broader channels or large outer harbors, within approximately 500 m – 1.6 km of major critical infrastructure elements, such as population or commercial centers. Within Zone 2, the consequences of even a large LNG spill are reduced. Thermal radiation transitions to less severe hazard levels to public safety and property.

Risk management strategies for LNG operations that occur in this zone should focus on vapor dispersion and fire hazards. The strategies should include incident management and emergency response measures that ensure areas of refuge (enclosed areas, buildings) are available, the development of community warning procedures, and education programs to ensure that communities are aware of precautionary measures.

Zone 3

This zone covers LNG shipments and deliveries that occur more than approximately 1.6 km from major infrastructures, population/commercial centers, or in large bays or open water, where the risks and consequences to people and property of a large LNG spill over water are minimal. Thermal radiation poses minimal risks to public safety and property.

Risk reduction and mitigation strategies can be significantly less complicated or extensive than Zones 1 and 2. Risk management strategies should concentrate on incident management and emergency response measures for dealing with vapor cloud dispersion. Measures should ensure that areas of refuge are available, and community education programs should be implemented to ensure that persons know what to do in the unlikely event of a vapor cloud.

2 BACKGROUND

Many studies have been conducted to assess the consequences and risks of LNG spills from both storage terminals and LNG tankers. However, while recognized standards exist for the systematic safety analysis of potential spills or releases from LNG storage terminals and facilities on land, no equivalent set of standards exists for the evaluation of the safety or consequences from LNG tanker spills over water. Since the incidents surrounding September 11, 2001, much larger spill scenarios and their potential consequences are being evaluated for many types of flammable cargo transportation, including LNG tankers.

Due to limited experience and experimental testing associated with large-scale spills over water, most studies use simplifying assumptions to calculate and predict the hazards of a large LNG spill. The range of assumptions and estimates for many complicated spill scenarios can lead to significant variability in estimating the probability, hazards, consequences, and overall risks of large LNG spills over water.

To address these issues, DOE requested that Sandia help to quantify potential credible threats to an LNG ship, assess the potential hazards and consequences from an LNG spill, and identify potential prevention and mitigation strategies that could be implemented to reduce the risks of a potentially large LNG spill over water. These efforts included:

- An in-depth literature search of the experimental and technical studies associated with evaluating the safety and hazards of LNG following a major spill from an LNG ship;
- A detailed review of four recent LNG spill modeling studies related to the safety implications of a large-scale LNG spill over water;
- Evaluation of potential scenarios for breaching an LNG cargo tank, both accidentally and intentionally, identification of the potential size of an LNG spill for those scenarios, and an assessment of the potential range of hazards and consequences from the spills; and
- Development of a risk analysis approach to quantify threats, assess hazards, and identify operational, safety, and security procedures and techniques to reduce to acceptable levels the probability, risks, and hazards of a large LNG spill over water.

To support its efforts, Sandia worked with the U.S. DOE, the U.S. Coast Guard, LNG industry and ship management agencies, LNG shipping consultants, and government intelligence agencies to collect background information on LNG ship and cargo tank designs, accident and threat scenarios, and standard LNG ship safety and risk management operations. The information gathered was used to develop accidental and intentional LNG cargo tank breach scenarios, for modeling of potential spill hazards, and as the basis for analysis to determine the extent and severity of LNG spill consequences. Based on analysis of the modeling results, three consequence-based hazard zones were identified and risk reduction and mitigation techniques were identified to reduce impacts on public safety and property.

The results of these evaluations are summarized in Sections 3 – 6 and detailed analyses are presented in Appendices A – D.

2.1 History and Description of LNG

Natural gas liquefaction dates back to the 19th century, when British chemist and physicist Michael Faraday experimented with liquefying different types of gases, including natural gas. A prototype LNG plant was first built in West Virginia in 1912, and the first commercial liquefaction plant was built in Cleveland, Ohio, in 1941. The Cleveland plant liquefied natural gas and stored the LNG in tanks, which was vaporized later for use during heavy demand periods. Natural gas continues to be liquefied and stored for use during peak demands, with almost 100 LNG peaking facilities in the U.S. [EIA 2002].

2.1.1 Growth of International LNG Transportation

In January 1959, the world's first LNG tanker, *The Methane Pioneer,* a converted World War II liberty freighter, carried an LNG cargo from Lake Charles, Louisiana to the United Kingdom. The U.S. began exporting LNG to Asia in 1969, when Phillips Petroleum built a liquefaction facility on the Kenai Peninsula, about 100 miles south of Anchorage, Alaska. The Phillips plant continues to operate and is one of the oldest continuously operated LNG plants in the world.

A fleet of about 150 specially designed LNG ships is currently being used to transport natural gas around the globe. Worldwide, there are 17 LNG export (liquefaction) terminals and 40 import (re-gasification) terminals. This commercial network handles approximately 120 million tons of LNG every year. LNG carriers often travel through areas of dense traffic. In 2000, for example, Tokyo Bay averaged one LNG cargo every 20 hours and one cargo per week entered Boston harbor. Estimates are that world wide LNG trade will increase 35% by 2020. The major areas for increased LNG imports are Europe, North America, and Asia [Kaplan and Marshal 2003] [DOE 2003].

Four LNG marine terminals were built in the United States between 1971 and 1980: Lake Charles, Louisiana; Everett, Massachusetts; Elba Island, Georgia; and Cove Point, Maryland. After reaching a peak receipt volume of four million tons in 1979, LNG imports declined when de-control of natural gas prices produced an economic supply of natural gas within U.S. borders. The Elba Island and Cove Point receiving terminals were mothballed in 1980. Due to the recent growth in natural gas demand, both of these terminals have undergone refurbishment and reactivation, and both are currently receiving LNG shipments. The Lake Charles and Everett terminals, which have operated below design capacity for many years, have also recently increased receipt of LNG.

Import of natural gas into the U.S. is expected to double over the next 20 years [DOE 2003]. Four to eight new LNG terminals are expected to be constructed in the next four to five years and more than 40 new terminal sites are under consideration and investigation. A factor in the siting of LNG receiving terminals is the proximity to market. Therefore, terminals are being considered in areas with high natural gas demands, which includes locations on all three U.S. coasts. Most are being planned to handle one to two LNG tanker shipments per week.

2.1.2 LNG Transportation by Ship

Specially designed ships are used to transport LNG to U.S. import terminals [Harper 2002] [OTA 1977]. Many LNG tankers currently in service use Moss spherical tanks, as illustrated in Figure 1. Moss tankers sometimes use nitrogen to purge some below-decks spaces to aid in preventing fires. Moss ship holds are designed to collect spilled LNG and the vessels contain equipment required to recover it [Glasfeld 1980]. In addition to Moss tankers, other LNG ships are designed with prismatic, membrane-lined cargo tanks.

Figure 1. Moss-Spherical LNG Tanker Ship

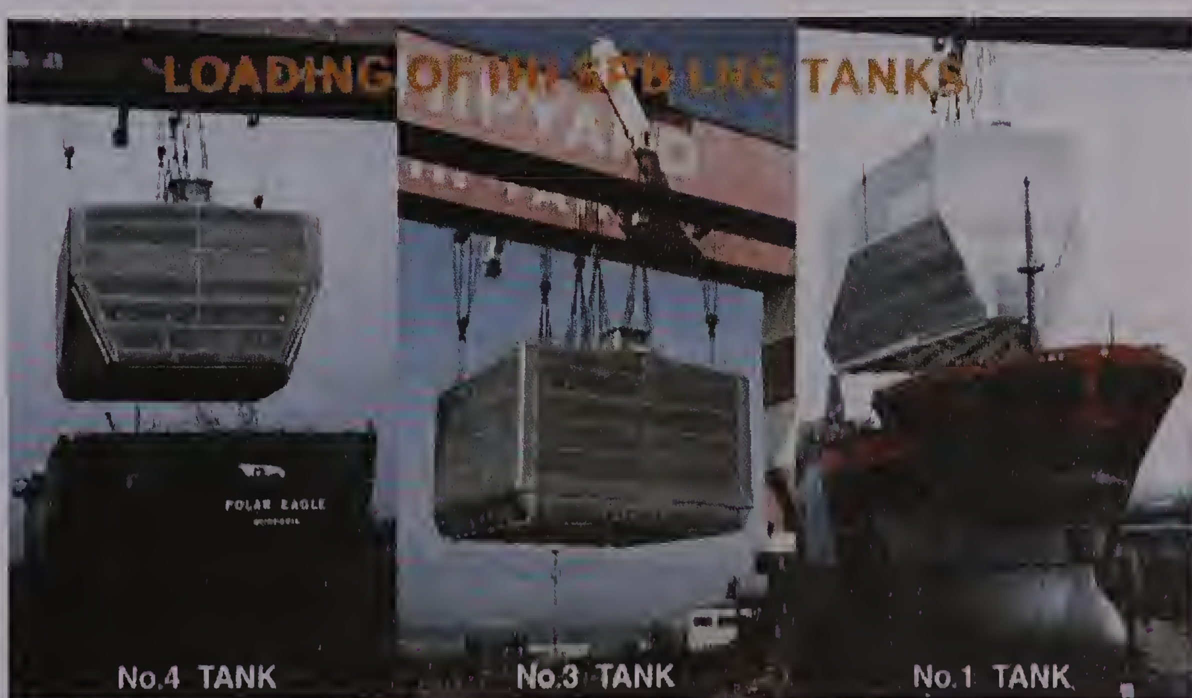


Figure 2. Prismatic Tanker Ship

Prismatic tanks are designed to conform to the shape of the ship's hull, thus occupying much of the internal area of the ship, which minimizes areas into which LNG from a tank rupture or spill can be diverted.

Some of the special features of LNG ships include:

- Construction of specialized materials and equipped with systems designed to safely store LNG at temperatures of -260 °F (-162.2°C).
- All LNG ships are constructed with double hulls. This construction method not only increases the integrity of the hull system but also provides additional protection for the cargo tanks in the event of an accidental collision.
- Coast Guard regulations and the "International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" (International Gas Carrier Code) require that LNG ships meet a Type IIG standard, which is an intermediate-level safety design standard for hazardous cargoes that includes direction on double-hull designs and materials, subdivision, damage stability, and cargo tank location.

During the past 40 years, more than 80,000 LNG carrier voyages have taken place, covering more than 100 million miles, without major accidents or safety problems, either in port or on the high seas [Pitblado 2004]. Over the life of the industry, eight marine incidents worldwide have resulted in LNG spills, with some damage; but no cargo fires have occurred. Seven incidents have been reported with ship structural damage, two from groundings; but no spills were recorded. No LNG shipboard fatalities from spills have occurred [Beard 1982] [SIGTTO 2003].

2.1.3 LNG Properties

Typical properties of LNG:

- LNG is simply natural gas that has been cooled to its liquid state at atmospheric pressure: -260°F (-162.2°C) and 14.7 psia. Currently, imported LNG is commonly 95% – 97% methane, with the remainder a combination of ethane, propane, and other heavier gases.
- LNG is transported at ambient pressures.
- Liquefying natural gas vapor, which reduces the gas into a practical size for transportation and storage, reduces the volume that the gas occupies more than 600 times.
- LNG is considered a flammable liquid.
- LNG vapor is colorless, odorless, and non-toxic.
- LNG vapor typically appears as a visible white cloud, because its cold temperature condenses water vapor present in the atmosphere.
- The lower and upper flammability limits of methane are 5.5% and 14% by volume at a temperature of 25°C.

Table 4 lists the flammability limits for several compounds.

Table 4: Flammability Limits for Selected Fuel Compounds at 25°C

FUEL	LOWER FLAMMABILITY LIMIT (LFL) % by volume in air	UPPER FLAMMABILITY LIMIT (UFL) % by volume in air
Methane	5.5	14.0
Butane	1.6	8.4
Propane	2.1	9.6
Ethanol	3.3	19.0
Gasoline (100 Octane)	1.4	7.8
Isopropyl alcohol	2.0	12.7
Ethyl ether	1.9	36.0
Xylene	0.9	7.0
Toluene	1.0	7.1
Hydrogen	4.0	75.0
Acetylene	2.5	85.0

2.2 Growing Interest in LNG Safety and Security

The increasing demand for natural gas will significantly increase the number and frequency of LNG tanker deliveries to ports across the U.S. Because of the increasing number of shipments, concerns about the potential for an accidental spill or release of LNG have increased. In addition, since the incidents surrounding September 11, 2001, concerns have increased over the impact that an attack on hazardous or flammable cargoes, such as those carried by LNG ships, could have on public safety and property.

The risks and hazards from an LNG spill will vary depending on the size of the spill, environmental conditions, and the site at which the spill occurs. Hazards can include cryogenic burns to the ship's crew and people nearby or potential damage to the LNG ship from contact with the cryogenic LNG. Vaporization of the liquid LNG can occur once a spill occurs and subsequent ignition of the vapor cloud could cause fires and overpressures that could injure people or cause damage to the tanker's structure, other LNG tanks, or nearby structures.

With the growing dependence on imported LNG to meet increasing U.S. natural gas demands, damage or disruption from a spill to an LNG import terminal or harbor facilities could curtail LNG deliveries and impact natural gas supplies. Therefore, methods to ensure the safety, security, and reliability of current or future LNG terminals and LNG shipments are important from both public safety and property perspectives, as well as from a regional, energy reliability standpoint. Methods to reduce the risks and hazards from a potential LNG spill must be considered on a site-specific basis and will vary, depending on factors such as location, geography, operational considerations, and weather conditions. The next section discusses the process used to assess LNG tanker safety and security from accidental and intentional events, improve overall protection, and reduce impacts on public safety and property.

3 RISK ASSESSMENT OF LNG SPILLS OVER WATER

High consequence operations such as the transportation, off-loading, and storage of LNG imply potential risks to people and property. Risk is defined as the potential for suffering harm or loss and is often quantified as the product of the probability of occurrence of a threatening event times the system vulnerability to that event and the consequences of that event. Thus,

Risk = $\mathbf{P_t}$ (threat occurring) x $\mathbf{P_s}$ (system failure/threat) x **Consequences**;

Where: $\mathbf{P_t}$ = the probability of an accidental or intentional threat,

$\mathbf{P_s}$ = the probability that preventive or mitigating measures fail, and

Consequences = usually expressed in fatalities or costs.

Effectively evaluating the risks of a large LNG spill over water requires that the potential hazards (results of events that are harmful to the public and/or property) and consequences be considered in conjunction with the probability of an event, plus the effectiveness of physical and operational measures of LNG transportation to prevent or mitigate a threatening event. For example, safety equipment, operational considerations and requirements, and risk management planning can work together to reduce the risks of an LNG spill by reducing both the probability of an event that could breach the LNG tanker and by reducing the consequences of a spill.

Because of the difficulty in assessing the effectiveness of ship safety measures and operational safety and security strategies, many studies assume the probability of an event and a ship's vulnerability to be one; therefore, the concentration is on calculating expected consequences. This often provides worst-case results with low probability and very high uncertainty, which can inappropriately drive operational decisions and system designs. Therefore, for high consequence and low probability events, a performance-based approach is often used for developing risk management strategies that will reduce the hazards and risks to both public safety and property.

3.1 Risk Analysis Elements of a Potential LNG Spill

The risk analysis approach of a potential LNG spill should include:

1. **Uncertainty:** Assessment of the accuracy of the assumptions used and the probable ranges.

2. **Comprehensiveness:** Do the failure modes considered account for all major avenues of loss? Understanding the full range of consequences associated with a catastrophe can require considerable effort. Completeness is important to properly support risk assessment and risk management.

   Two important variables are 'directness of effect' and 'latency.' For example, if an explosion breaches an LNG cargo tank on a ship, that is a direct effect. Conversely, if a resulting explosion damages an LNG terminal—hampering future LNG deliveries for extended periods—that is an indirect or latent effect. Latency refers to when the effects are felt. Immediate effects occur simultaneously with the threat; whereas latent effects occur after an interval, the length of which might vary from system to system. It should be emphasized that indirect/latent effects sometimes dominate other consequences.

3. **Evaluation of risk reduction measures:** One way to reduce risk is to remove or block the threat; i.e., prevent the disaster from occurring in the first place. For example, reinforce ships against collisions or reduce ship speeds in a harbor to reduce the chance of a spill.

4. **Threat as a moving target:** Many avenues to failure — mechanical, environmental insult, operator error — are amenable to analysis and can be confidently predicted to occur with some probability in the future. Other types of threats can be constantly changing and difficult to assess accurately, requiring more robust approaches for prevention or mitigation and frequent re-evaluations of new threats.

3.2 LNG Spill Risk Assessment and Management Process

A general performance-based risk assessment and risk management process is shown schematically in Figure 3. The risk analysis, in turn, helps support a program for managing risks of LNG deliveries to terminals for site-specific locations and conditions. The risk assessment and management process includes:

- Evaluating the potential for an event that could cause a breach or loss of LNG from a ship;
- Establishing the potential damage to a cargo tank or other system from these events and the potential spills that could occur;
- Estimating the volume and rate of a potential LNG spill based on the dimensions and location of the breach, properties and characteristics of the LNG, ship construction and design, and environmental conditions (e.g., wind, waves, currents, etc.);
- Estimating the dispersion, volatilization, and potential hazards of a spill based on physical and environmental conditions; and
- When necessary, identifying prevention and mitigation approaches and strategies to meet risk management goals.

As illustrated in Figure 3, if risks, costs, or operational impacts are deemed to be too high, the overall process cycles back through the evaluation to identify alternative approaches for improving system performance. Safeguards could include a range of risk management options: improvements in ship protection, modification of existing operational and safety and security management procedures, improvements in emergency response coordination, or changes in support operations or services. The risks are then re-evaluated according to the new approaches to determine if they meet identified risk management goals. If not, then the evaluations can be repeated with additional provisions or changes until the risk management goals are reached. The potential alternatives, changes, and/or upgrades can be compared through the process to identify appropriate and effective approaches for improving overall system safety and security.

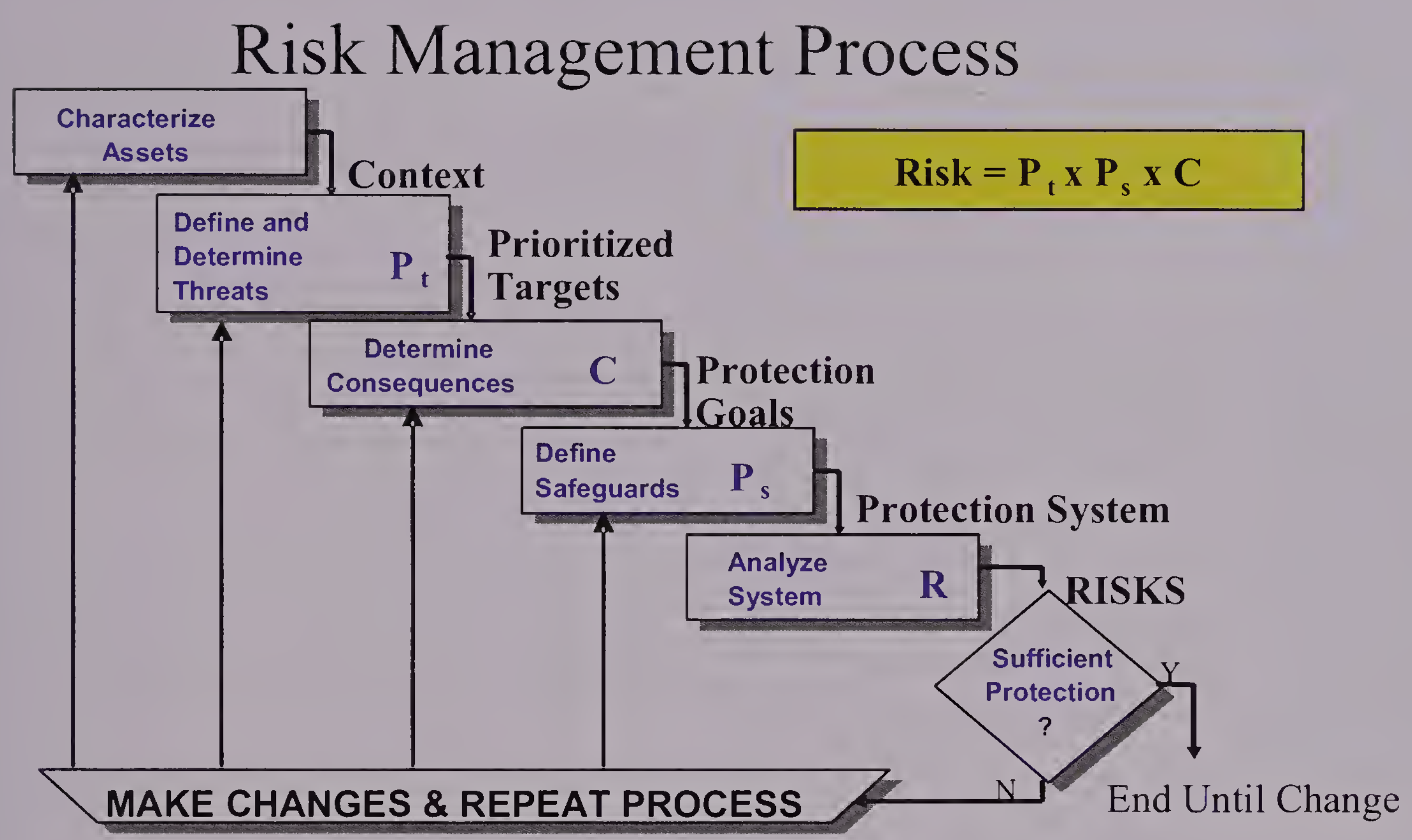


Figure 3. Risk Assessment and Risk Management Approach

Deciding on the sufficiency of protection measures to meet risk management goals is often aided by a benefit-cost evaluation. In most locations and most operations, some level of risk is common and, therefore, a "residual" risk often remains. For example, certain levels of safety equipment are standard features in automobiles, such as seat belts, air bags, and antilock brakes. While they might be effective safety measures, they do not provide total protection in all automobile accident scenarios. Therefore, the public does have some level of risk associated with driving.

How might risk management considerations apply to LNG transportation and off-loading? Table 5 illustrates some examples of potential LNG transportation safeguards and associated impacts on overall effectiveness, cost, operations, and residual risks.

Table 5: Examples of Potential LNG Transportation Safeguards and Impacts

SAFEGUARD ACTION	RISK REDUCTION	RESIDUAL RISKS	CONSEQUENCE IMPROVEMENT	COST OF SAFEGUARD APPROACH	OPERATIONAL IMPACTS
Smaller LNG tankers	Potential smaller fire size and shorter fire duration	Thermal hazards from small fire, higher accident potential with increased shipments	potential reduction in hazard zone and reduced impacts on public safety and property	Increased shipping costs, increased energy costs	Increased number of shipments, additional port disruption
Evacuation during LNG shipments	Reduce hazards to people from potential spill	Hazards to property from a fire, accidents during evacuation	Reduce injuries and deaths from potential fire	Labor intensive, increased costs for emergency services	Disruption of evacuees
Remote terminal and pipeline	Reduce impacts on public safety and property from potential fire	Impact on public safety and property from potential pipeline leaks	potential reduction in hazards from large-scale or catastrophic fire	potential high capital costs, increased energy costs	Pipeline vulnerability issues

While many potential safeguards might be identified for a given location, the level of risk reduction and risk management required to be protective of public safety and property for LNG transportation will vary based on site-specific conditions. The risk management goals for a given location should be determined in cooperation with all stakeholders. Stakeholders include the general public, public safety officials and elected officials, facility operators, port and transportation safety and security officials, underwriters, utility representatives, regulatory agencies, and ship management companies.

3.3 The Elements of an LNG Spill over Water

The detailed flowchart ('event tree') in Figure 4 illustrates an overview of event sequences that might ensue following a breach of an LNG cargo tank and /or a spill. The purpose of the flowchart is to provide a basis for a comprehensive risk analysis. In the event tree, time progresses roughly from left to right, beginning with a potential breach or damage of an LNG cargo tank or LNG handling system; progressing to an LNG spill, dispersion, and energy release; ending with an analysis of impacts on people and property. The event tree approach helps ensure that all credible events are considered systematically and helps identify critical elements in the event sequence. This aids in focusing risk management efforts on the most important elements, and improving both public safety and security more efficiently and cost-effectively. As shown in the event tree, the hazards and consequences from potential spills can vary.

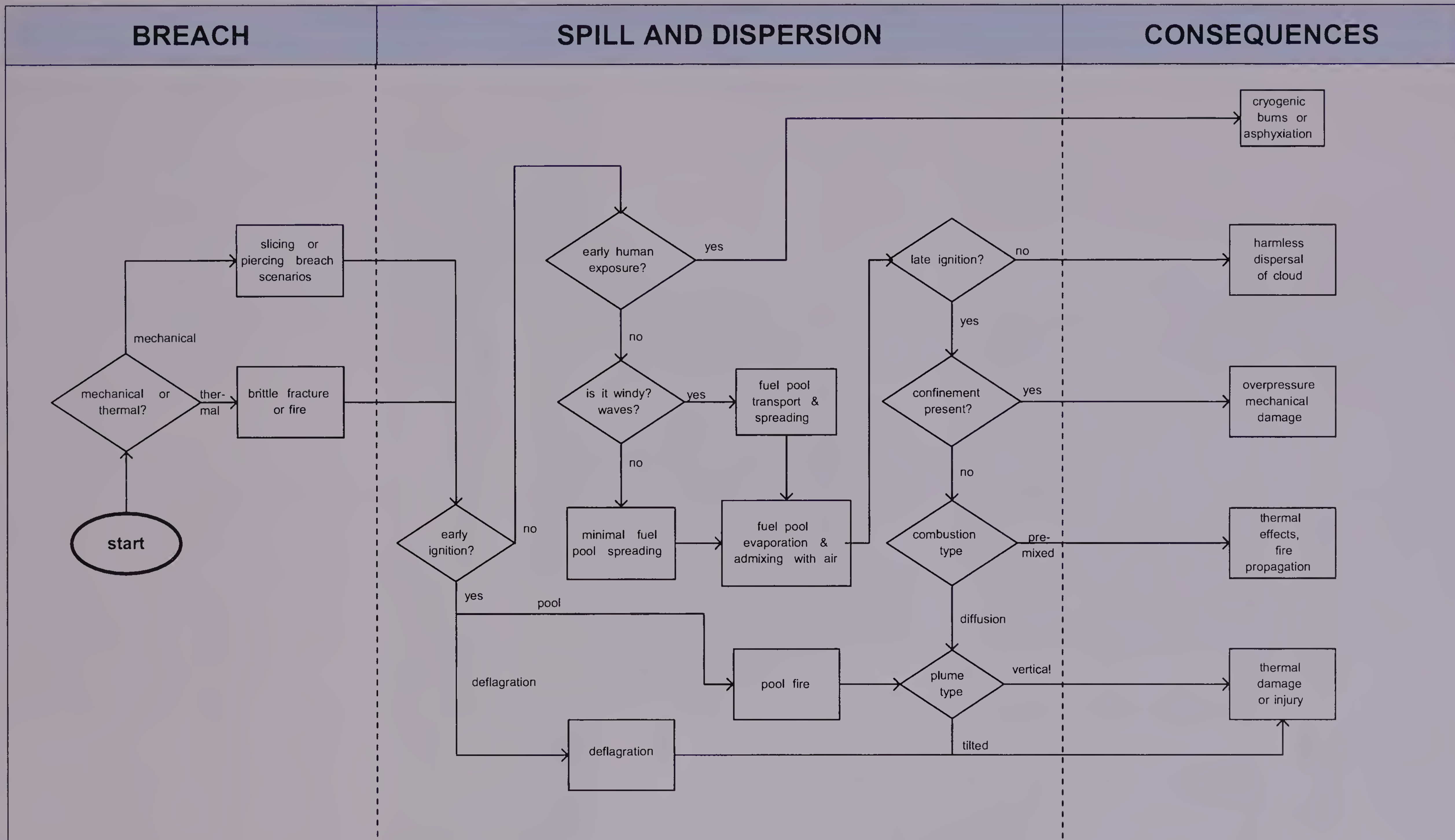


Figure 4. Potential Sequences of Events Following a Breach of an LNG cargo tank

3.3.1 LNG Cargo Tank Breaches

The variables that influence an LNG cargo tank breach include:

- Type and location of the breach and the energy involved,
- The vessel's geometry, its construction and materials, hold spaces, distance between hulls, tonnage, and event mitigation systems;
- LNG cargo tank construction and size; and
- The fluid mechanics and thermodynamic characteristics of LNG.

Figure 5 illustrates a breach and subsequent spill involving a Moss tanker. If the cargo tank is punctured, LNG driven only by weight of the fluid itself will traverse the ship's below-decks spaces plus the ballast space between the two hulls, which are empty when a full cargo is on board [Kaplan and Marshall 2003]. The speed at which an LNG spill will progress will depend on the size and location of the breach in the LNG cargo tank.

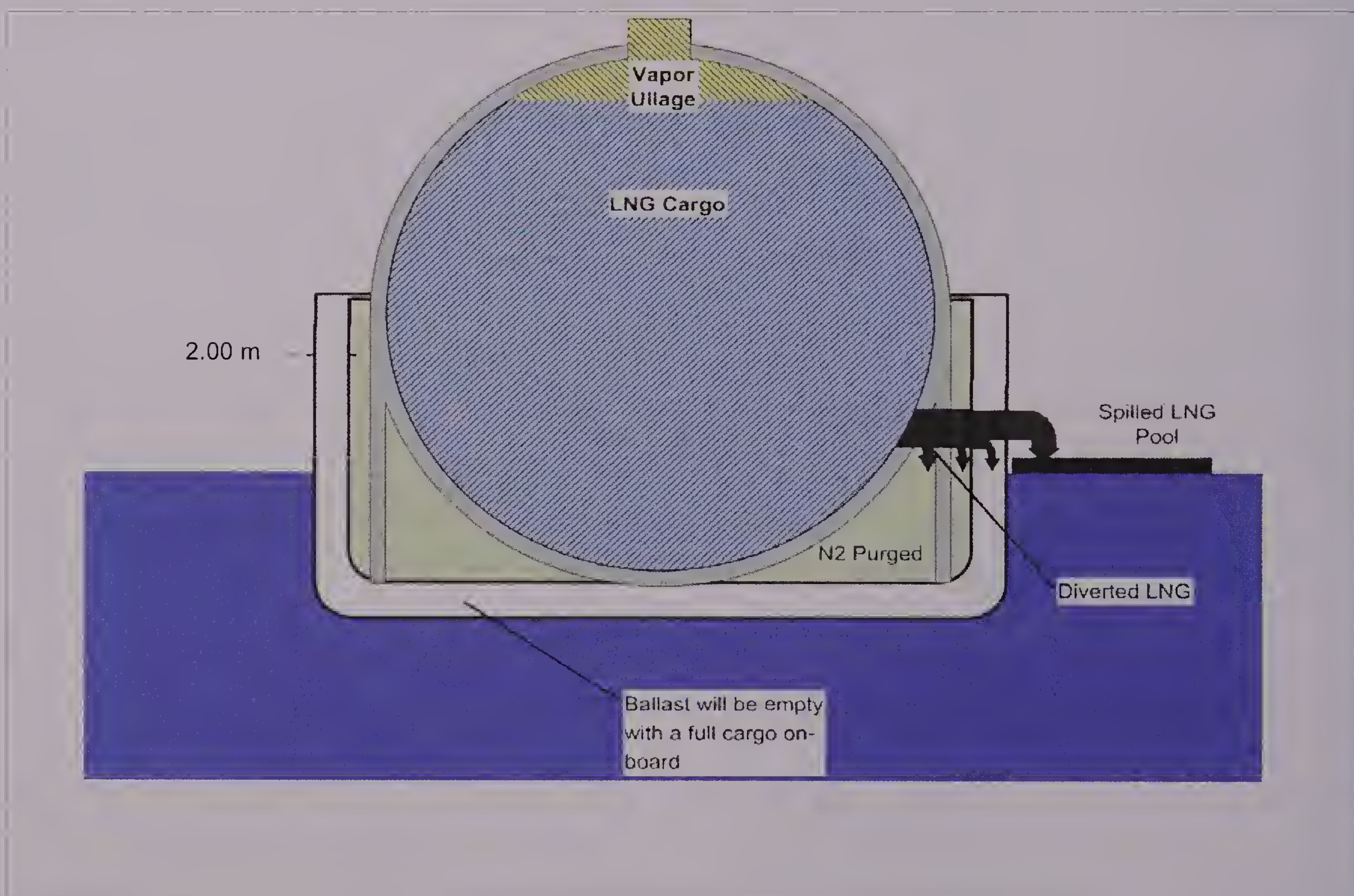


Figure 5. Anatomy of an LNG Spill on Water

For LNG cargo tank designs, a realistic estimate of tanker losses (i.e., the fraction of the spill that reaches the water) must be reduced to account for LNG diverted to the ballast space or, for the Moss spherical design, vacant hold areas. Spill damage to the ship from contact with the cryogenic LNG and/or from fire damage to the ship or its other LNG cargo tanks are consequences that were considered during this study. Based on the analyses, the potential for damage to the ship cannot be ruled out, especially for large spills. However, it was concluded that releases from no more than two or three tanks would be involved in a spill at

any one time. This cascading release is not expected to increase significantly the overall fire size or hazard ranges, but the expected fire duration would increase.

The potential size and impact from several breaching scenarios from both accidental and intentional events were evaluated and are summarized in Sections 4 and 5 and discussed in detail in Appendix B – *Threat Analysis and Spill Probability*.

3.3.2 LNG Spill Dispersion after a Breach

Quantifying the size and likelihood of spills from different events drives the *Spill and Dispersion* part of the event tree. Following a tank breach or other spill event, depending on the size and location, LNG can be expected to spill onto or into the LNG ship itself, escape through a breach onto the water surface, or both. Depending on whether there is early or late ignition, LNG dispersion can occur through either volatilization of the LNG into the air and transport as a vapor cloud or transport as a liquid on the surface of the water.

Several variables must be addressed in developing an assessment of an LNG spill and its general dispersion, including potential ignition sources and ignition times. These factors determine whether the LNG disperses without a fire, burns as a pool fire, or burns as a vapor fire. Assumptions made in addressing or analyzing these variables can have a significant impact on estimates of the potential hazards associated with an LNG spill. The experimental results from a wide range of spill and dispersion testing were evaluated and the expected impacts of large-scale spills over water were evaluated. They are summarized in Sections 4 and 5 and discussed in detail in Appendix C – *LNG Spill and Dispersion Analysis*.

3.3.3 Potential Consequences from an LNG Spill over Water

The consequences or hazards from an LNG spill include a wide range of potential events, as illustrated in the event tree. The sections below discuss the analyses that should be considered in a study attempting to assess the consequences and hazards of an LNG spill for a specific site. The potential hazards and their results were reviewed and evaluated and are summarized in Sections 4 and 5, and discussed in detail in Appendix C – *LNG Spill and Dispersion Analysis* and Appendix D – *Spill Consequence Analysis*.

Asphyxiation

Methane is considered a simple asphyxiant, but has low toxicity to humans. In a large-scale LNG release, the cryogenically cooled liquid LNG would begin to vaporize upon release from the breach of an LNG cargo tank. If the vaporizing LNG does not ignite, the potential exists that the LNG vapor concentrations in the air might be high enough to present an asphyxiation hazard to the ship crew, pilot boat crews, emergency response personnel, or others that might be exposed to an expanding LNG vaporization plume. Although oxygen deficiency from vaporization of an LNG spill should be considered in evaluating potential consequences, this should not be a major issue because flammability limits and fire concerns will probably be the dominant effects in most locations.

Cryogenic Burns and Structural Damage

The very low temperature of LNG suggests that a breach of an LNG cargo tank that could cause the loss of a large volume of liquid LNG might have negative impacts on people and property near the spill, including crewmembers or emergency personnel. If LNG liquid contacts the skin, it can cause cryogenic burns.

Potential degradation of the structural integrity of an LNG ship could occur, because LNG can have a very damaging impact on the integrity of many steels and common ship structural connections, such as welds. Both the ship itself and other LNG cargo tanks could be damaged from a large spill.

Combustion and Thermal Damage

In general, combustion resulting from industrial incidents such as an LNG spill can result in thermal and/or pressure loading. Thermal loads are very dependent on the rate of energy conversion ('heat release rate'). Pressure loads are very dependent on the power density; that is, the heat release rate per unit volume. Thus, how combustion occurs is as important to the consequences of a spill as is the energy available. Table 6 shows the general type of thermal radiation damage from a fire. These levels are often used to establish fire hazard areas.

Table 6: Common, Approximate Thermal Radiation Damage Levels

Incident Heat Flux (kW/m^2)*	Type of Damage
35 – 37.5	Damage to process equipment including steel tanks, chemical process equipment, or machinery
25	Minimum energy to ignite wood at indefinitely long exposure without a flame
18 – 20	Exposed plastic cable insulation degrades
12.5 – 15	Minimum energy to ignite wood with a flame; melts plastic tubing
5	Permissible level for emergency operations lasting several minutes with appropriate clothing

*Based on an average 10 minute exposure time

[Barry 2002]

For example, the National Fire Protection Association standard for the production, storage, and handling of Liquefied Natural Gas (Standard 59A) recommends that an incident heat flux value of 5 kW/m^2 be the design level that should not be exceeded at a property line or in areas where groups of more than 50 people might assemble [NFPA 2001]. Therefore, 5 kW/m^2 is a commonly used value for establishing fire protection distances for people. While structures might be able to withstand higher levels of incident heat flux, as shown in Table 6, heat flux levels approaching 35 kW/m^2 will cause significant damage to structures, equipment, and machinery.

Generally, combustion of LNG vapor is controlled by two limiting factors: 1) whether the LNG vapor does not have enough time to mix with the air (called non-pre-mixed combustion), and 2) whether the ignition occurs after the fuel has time to mix with the surrounding air (appropriately called 'pre-mixed combustion'). Therefore, ignition time is important in spill scenarios to assess appropriately the type and extent of thermal radiation

from an LNG spill and fire. As noted in Table 6, combustion and thermal damage from a fire can have severe consequences and should be carefully and thoroughly analyzed.

LNG/Fireballs

Two types of combustion modes might produce damaging pressure: 'deflagration' and 'detonation'. Deflagration is a rapid combustion that progresses through an unburned fuel-air mixture at subsonic velocities; whereas, detonation is an extremely rapid combustion that progresses through an unburned fuel-air mixture at supersonic velocities. For low reactivity fuels such as natural gas, combustion will usually progress at low velocities and will not generate significant overpressure under normal conditions. Ignition of a vapor cloud will cause the vapor to burn back to the spill source. This is generally referred to as a 'fireball', which, by its nature, generates relatively low pressures, thus having a low potential for pressure damage to structures.

LNG/Air Explosions

Certain conditions, however, might cause an increase in burn rate that does result in overpressure. If the fuel-air cloud is confined (e.g., trapped between ship hulls), is very turbulent as it progresses through or around obstacles, or encounters a high-pressure ignition source, a rapid acceleration in burn rate might occur [Benedick et al. 1987]. The potential for damaging overpressures from such events could occur under some limited spill and dispersion scenarios, specifically in confined areas. However, effects will be localized near the spill source and are not expected to cause extensive structural damage.

Rapid Phase Transitions (RPT)

Rapid Phase Transitions occur when the temperature difference between a hot liquid and a cold liquid is sufficient to drive the cold liquid rapidly to its superheat limit, resulting in spontaneous and explosive boiling of the cold liquid. When a cryogenic liquid such as LNG is suddenly heated by contacting a warm liquid such as water, explosive boiling of the LNG can occur, resulting in localized overpressure releases. Energy releases equivalent to several kilograms of high explosive have been observed. The impacts of this phenomenon will be localized near the spill source and should not cause extensive structural damage.

3.4 Evaluation of Four Recent LNG Spill Modeling Studies

Four recent LNG spill-modeling studies were evaluated to assess whether they provide a definitive determination of the lateral extent and thermal hazards of a large-scale release of LNG over water. The results of the comparisons are summarized below and detailed in Appendix A. The studies reviewed include:

- "Comparison of Hypothetical LNG and Fuel Oil Fires on Water." Report by the National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, Seattle, WA, 2003, DRAFT [Lehr and Simicek-Beatty 2003].
- "Model of spills and fires from LNG and oil tankers." Journal of Hazardous Materials, B96-2003, 171-188, 2003 [Fay 2003].
- "Modeling LNG Spills in Boston Harbor." Copyright© 2003 Quest Consultants, Inc., 908 26th Ave N.W., Norman, OK 73609; Letter from Quest Consultants to DOE

(October 2, 2001); Letter from Quest Consultants to DOE (October 3, 2001); and Letter from Quest Consultants to DOE (November 17, 2003) [Quest 2003].

- "Liquefied Natural Gas in Vallejo: Health and Safety Issues." LNG Health and Safety Committee of the Disaster Council of the City of Vallejo, CA, January 2003 [Vallejo 2003] [Koopman 2004].

An event tree of generic LNG spill scenarios was used to compare and contrast the analysis process in each study. Table 7 summarizes and illustrates the range of assumptions employed in each of the four studies for evaluating a potential LNG cargo tank breach plus an associated fuel spill, its spread and dispersion, and fuel ignition and burning. All the studies assumed ignition such that the fuel burns as a pool fire, with no explosions.

Table 7: Summary of Assumptions in the Four Studies Analyzed

STUDY	TIME TO EMPTY (Min)	VAPORIZES DURING SPREAD	EFFECT OF WAVES INCLUDED	POOL SHAPE	IGNITION TIME	FLAME MODEL	COMBUSTION MODE	IGNITION AT POOL; NOT IN VAPOR CLOUD
Lehr	Instantly	Yes	No	Circle	Instantly	Solid cylinder	Diffusion flame with no explosion	Yes
Fay	Varies with hole size	Yes	No	Semicircle	Instantly	Point source	Diffusion flame with no explosion	Yes
Quest	2	Yes	Yes	Circle	Instantly after spread	Solid cylinder that includes tilt for wind effects	Diffusion flame with no explosion	Yes
Vallejo	Varies with hole size	Yes	No	Circle	Instantly	Point source	Diffusion flame with no explosion	Yes

Table 8 presents a summary of the LNG spill and fire hazard predictions for each of the studies. The distances between the fuel fire and specific thermal hazards are shown in the columns labeled as "Skin Burn Distance" and "Paper Ignition Distance." A secondary indicator of thermal hazard is shown in the "Fire Duration" column.

Significant differences were observed among the studies in the thermal hazard distances calculated, due to each analyst's use of different fuel spill volumes and different approximations in the models for spill spreading, fuel burning, and heat transfer. The *Vallejo*, *Quest,* and *Fay* reports addressed comparable large spills; and the *Lehr* paper concentrated on spills that were twenty-five to fifty times smaller in volume.

Each of the studies differed in its use of models for fire and heat transfer. For example, if identical fuel spill areas and fire thermal emission levels are used as inputs, the heat transfer models used in the *Quest* and *Fay* studies predict thermal hazards that differ by 30%, due to the flame model and pool size assumptions noted in Table 7. Each of the studies assumed a source of ignition (required to start a fire), but excluded consideration of the timing of ignition relative to the release and spreading of the LNG.

Table 8: Summary of Results of Four Recent LNG Studies Analyzed

STUDY	FUEL SPILL VOLUME (m^3)	AREA OF FUEL SPILL (m^2)	"SKIN BURN" DISTANCE[a] (m)	"PAPER IGNITION" DISTANCE[b] (m)	FIRE DURATION (min)
Lehr	500 (hole area not specified)	not reported	500[c]	not reported	2-3
Fay[e]	14,300 ($20m^2$ hole area)	200,000	1900	930	3.3
Quest	12,500 ($20m^2$ hole area)	9503	490[d]	281[d]	28.6
Vallejo	14,300 ($20m^2$ hole area)	120,000	1290	660	9

[a]Thirty-second exposure to heat levels of 5 kW/m^2 causes second-degree skin burns (blisters) at this distance.
[b]Seventeen-second exposure to heat levels of 22 kW/m^2 causes newspaper to ignite at this distance. [SFPE Handbook of Fire Protection Engineering, 2nd ed., National Fire Protection Association, (1995)]
[c] Distance from edge of spill
[d]Assuming a wind speed of 9 m/s (20 mph).
[e] Considers a range of hole sizes. This size chosen for comparison.

The studies also differed in their use of meteorological conditions, such as waves for the locations considered. *Quest* is the only study that used an LNG spill dispersion model in which the impact of waves on the spill pool area was considered. Many of the assumptions and parameters used in the calculations and analyses were not specifically validated.

While existing analytical models and techniques can be used to provide general guidance on the potential hazards associated with a large LNG spill, the four studies do demonstrate how differences in the assumptions of spill size, fire modeling parameters, and environmental factors can have a significant impact on calculated hazard distances. Therefore, the studies show how important it is to use appropriate assumptions, data, and models in trying to develop an accurate assessment of hazards from an LNG spill. While each of the studies provides an example of the potential consequences of a large-scale LNG spill over water, none of the studies identified the probability of the postulated events and assumptions, nor did any discuss mechanisms or strategies that could be implemented to reduce the potential risks of such a spill. Therefore, they do not provide a characterization of how to manage the risks to people and property of a large-scale LNG spill over water

4 ACCIDENTAL LNG BREACH, SPILL, AND HAZARD ANALYSES

Currently, the potential for an accidental LNG cargo tank breach, the dynamics and dispersion of a spill, and the hazards of such a spill, are only generally understood because the combination of LNG ship designs and current safety management practices for LNG transportation have reduced LNG accidents to a level such that there is little historical or empirical information on breaches or spills.

This lack of information forces analysts to make many assumptions and simplifications when calculating the size, dispersion, and thermal hazards of a spill, as discussed in Section 3 and detailed in Appendix A for four recent LNG spill studies. Therefore, it should be understood that while many existing models and techniques can be used to provide adequate guidance on the hazards of an LNG spill, a level of variability can exist in estimating the potentiality and size of a breach and the extent of the hazards from an associated spill.

This section summarizes the modeling and analyses conducted to assess the potential for an accidental breach of an LNG cargo tank, the probable size of a potential accidental breach, and the associated spill size and hazards to people and property from a resulting spill. The detailed results of these analyses are presented in Appendices B – D.

4.1 Analysis of Accidental Breach Scenarios of an LNG Cargo Tank

As noted in Section 2 of this report, the LNG industry has an exemplary safety record, with only eight accidents over the past 40 years. None of these accidents led to a loss of life. Even with this excellent safety record, consideration should be given to what might be a likely LNG cargo tank breach based on a potential accidental collision with another ship, grounding, or ramming. The severity of a breach based on these events depends on the location, vessel design, relative vessel speeds and collision alignment, and mitigation or prevention systems in place to limit potential damage.

Using previously conducted finite element modeling of collisions of a series of ships with a double-hulled oil tanker similar in overall size, mass, and design to an LNG vessel, we were able to estimate the level of damage and hole sizes expected for several different accident scenarios [Ammerman 2002]. These analyses were conducted using PRONTO-3D, a transient dynamic, explicitly integrated, Eulerian finite volume code. The analysis tracked the progressive failure of the struck ship as the striking ship penetrated and the results are discussed and presented in detail in Appendix B. The results show that breaching of the inner hull does not occur until impact velocities exceed approximately 5 – 6 knots for large vessels. For small vessels, such as pleasure craft, the kinetic energy is generally insufficient to penetrate the inner hull of a double-hulled vessel such as an LNG ship. This analysis also calculated that penetration into a double-hulled tanker must be approximately three meters before a hole occurs in the inner hull, which can be used to estimate the minimum size of a penetration to cause a spill in a grounding event.

Because of the additional insulation and third level of containment in many LNG vessels, it is expected that a deeper penetration would be required to rupture the primary LNG cargo tank. Therefore, because of its general design and construction, collision velocities for equivalent hole sizes could be expected to be one to two knots higher for an LNG vessel. This would suggest that the required velocity to cause a breach of an LNG cargo tank during a 90 deg collision with a large vessel could be six to seven knots.

After a collision with an LNG tanker in which LNG is pouring out, the striking ship would probably back out, unless it could not move. In many collisions between two ships, the ships can remain joined for several hours, if significant penetration of one ship occurs. The analysis by Ammerman discussed in Appendix B suggests that as little as 5% – 10% of the generated breach size would be available for the release of LNG. Therefore, the collision of a large ship with an LNG carrier at even 10 knots is expected to produce an effective hole size of no more than approximately one square meter for an LNG spill.

The size and location of potential breaches were used as a basis for analysis of the potential for cryogenic damage to the structural steel of an LNG ship from a spill. Contact of steel with cryogenic fluids is known to cause embrittlement, which can significantly reduce the strength of steel [Vaudolon 2000]. A detailed structural analysis was beyond the scope of this review; but structural integrity embrittlement scoping analyses were conducted to assess the potential damage to an LNG ship from small and large LNG spills based on available fracture mechanics data and models. These analyses were guided by available information on LNG ship and tank designs, construction, and structural steel material property data [Linsner 2004] [Shell 2002] [Wellman 1983] and are discussed in detail in Appendix D.

In general, the results suggest that the critical flaw size for cryogenic damage of common LNG ship steels is less than one-tenth of an inch. It is common to see flaws of this size in typical, welded construction or around corrosion areas. Therefore, it is expected that some cryogenic damage of the LNG vessel, even for some accidental spills, would be likely. The extent and impact of the damage will depend on the breach and spill size and location and effectiveness of risk prevention and mitigation strategies and should be considered relative to overall ship integrity and LNG cargo tank support integrity.

A summary of the potential breach size and potential ship damage from several different accident scenarios is presented in Table 9, based on the detailed analyses presented in Appendices B and D.

Table 9: Estimated LNG Cargo Tank Breach Sizes for Accidental Scenarios

ACCIDENTAL BREACHES			
Type	**Breach Size**	**Tanks Breached**	**Ship Damage**
Accidental collision with small vessel	None	None	Minor[b]
Accidental collision with large vessel	5 - 10m^2 (Spill area 0.5 – 1m^2)[a]	1	Moderate[c]
Accidental Grounding	None	None	Minor

Notes: a - Assumes vessels remain joined during spill event and breach is mostly plugged
b - Minor suggests ship can be moved and unloaded safely
c – Moderate suggests damage that might impact vessel and cargo integrity

The potential breaching of an LNG cargo tank due to an accident, such as a collision or grounding, appears to be minimal. Such a breach can be easily reduced through a number of operational mechanisms, including managing ship traffic, coordinating ship speeds, and by active ship control in inner and outer harbors where the consequences of a potential LNG spill might be most severe. These methods are all currently used by the Coast Guard. Therefore, the safety and hazard issues that can lead to an accidental breach appear manageable with current safety policies and practices.

4.2 Spill and Hazard Analysis of an Accidental Breach of a Cargo Tank

After developing an assessment of the potential sizes of LNG cargo tank breaches, the relative size of various spills and potential hazards and impacts on public safety and property were assessed. These results are discussed in detail in Appendix C for evaluation of spill dispersion and volatilization and thermal impacts; and in Appendix D for evaluation of asphyxiation, LNG ship structural damage, and structural damage to critical infrastructure elements.

4.2.1 Fire Hazard Evaluation of an Accidental LNG Spill

In most of the scenarios identified, the thermal hazards from an accidental spill are expected to manifest as a pool fire, based on the high probability that an ignition source will be available from most of the events identified. Based on a detailed review of the existing experimental literature presented in Appendix C, nominal fire modeling parameters were used to calculate the expected thermal hazards from a fire for the accidental breach scenarios developed.

For example, a solid flame model that accounts for view factors and transmissivity and the Moorhouse correlation for flame height to diameter was used. A low wind condition was assumed; therefore, flame tilt and drag were not required. A surface emissive power of 220 kW/m^2, a transmissivity value of 0.8, and a burn rate of 3×10^{-4} were also used. The volume of the spill assumed for each breached LNG cargo tanks was approximately 12, 500 m^3 or about half the contents of the average LNG cargo tank. The fire duration was based on the hole size, associated spill rate and the assumed burn rate.

Several significant fire parameters have a range of values, thus a parameter variation was performed to ascertain the result on thermal hazard distance. By grouping these parameters to result in extremes of hazard distances, it can be shown that the ranges can vary by factors of five to ten. Such groupings are not probable; therefore, it is more reasonable to choose a nominal case and conservatively vary different factors individually to bounding values to obtain hazard distances. This general approach is presented in Appendix D and a summary of the results calculated using that approach for potential accidental spills is shown in Table 10, where the distance to 37.5 kW/m^2 and 5 kW/m^2 is from the center of the pool.

Table 10: Effect of Parameter Combinations on Pool Diameter in an Accidental Breach

HOLE SIZE (m^2)	TANKS BREACHED	DISCHARGE COEFFICIENT	BURN RATE (m/s)	SURFACE EMISSIVE POWER (kW/m^2)	POOL DIAMETER (m)	BURN TIME (min)	DISTANCE TO 37.5 kW/m^2 (m)	DISTANCE TO 5 kW/m^2 (m)
1	1	.6	$3X10^{-4}$	220	148	40	177	554
2	1	.6	$3X10^{-4}$	220	209	20	250	784
2	3	.6	$3X10^{-4}$	220	362	20	398	1358

The results presented in Table 10 show that thermal hazards of 37.5 kW/m^2 from a potential accidental breach of an LNG cargo tank and potential fire are expected to exist within approximately 150 - 250 m of the spill, depending on site-specific conditions. Thermal hazards of 5 kW/m^2 are expected to exist out to 500 and 750 m from the spill.

The multi-hole spill scenario presented considers the potential for a failure of three cargo tanks due to a long-duration fire that might occur in a smaller accidental spill. The impact of a fire on adjacent LNG cargo tanks is discussed in detail in Appendix D. Based on this analysis, depending on cargo tank design and fire duration, the potential for cascading damage to additional LNG tanks cannot be ruled out. A conservative estimate of the size of such a cascading fire and the thermal hazard distances from the fire were calculated assuming three simultaneous ruptures. In reality, the tank ruptures would more likely be sequential and, therefore, the hazard distances presented should be considered as conservative estimates.

4.2.2 Evaluation of Vapor Dispersion Hazard of Accidental LNG Spills

In most of the scenarios identified, the thermal hazards from an accidental spill are expected to manifest as a pool fire, based on the high probability that an ignition source will be available from most of the events identified. In some instances, an immediate ignition source might not be available and the spilled LNG could, therefore, disperse as a vapor cloud. Based on Sandia's review of data discussed in Appendix C, the vapor cloud for large spills could extend to beyond 1600 m, depending on spill location and site atmospheric conditions. In congested or highly populated areas, an ignition source would be likely; as opposed to remote areas, in which an ignition source might be less likely.

This suggests that LNG vapor dispersion analysis should be conducted using site-specific atmospheric conditions, location topography, and ship operations to assess adequately the potential areas and levels of hazards to public safety and property. Risk mitigation measures, such as development of procedures to quickly ignite a dispersion cloud and stem the leak, should be considered if conditions exist that the cloud would impact critical areas.

If ignited close to the spill, and early in the spill, the thermal loading from the vapor cloud ignition might not be significantly different from a pool fire, because the ignited vapor cloud would burn back to the source of liquid LNG and transition into a pool fire. If a large vapor cloud formed, the flame could propagate downwind, as well as back to the source. If the cloud is ignited at a significant distance from the spill, the thermal hazard zones can be extended significantly. The thermal radiation from the ignition of a vapor cloud can be very high within the ignited cloud and, therefore, particularly hazardous to people.

In order to obtain LNG dispersion distances to the lower flammability level (LFL) for accidental events, calculations were performed using VULCAN, a CFD code capable of simulating fire and non-fire conditions. The details of this modeling approach are discussed in detail in Appendix D. A low wind speed and highly stable atmospheric condition were chosen because this has shown to result in the greatest distances to LFL from experiment, and thus should be most conservative. A wind speed of 2.33 m/s at 10 m above ground and an F stability class were used for these simulations. The time it took for the LFL to be reached was approximately 20 minutes. As indicated in Table 11, dispersion distances to LFL for LNG spill vapor dispersion from an accidental spill might conservatively be approximately 1500 to 1700 m.

Table 11: Dispersion Distances to LFL for Accidental Spills

HOLE SIZE (m^2)	TANKS BREACHED	POOL DIAMETER (m)	SPILL DURATION (min)	DISTANCE TO LFL (m)
1	1	148	40	1536
2	1	209	20	1710

The results from the fire and vapor dispersion calculations suggest that high thermal hazards for accidental spills do not extend significantly from the spill location, but that some thermal hazards are possible to significant distances, especially if a vapor cloud occurs without early ignition and drifts into a critical area of facility. Table 12 summarizes the estimated results of the impact on public safety and property for an accidental LNG cargo tank breach and spill. In this table, high impact would include a thermal intensity in the range of 37.5 kW/m^2 and low values would correspond to thermal intensities in the range of 5 kW/m^2.

Table 12: Estimated Impact of Accidental LNG Breaches & Spills on Public Safety & Property

EVENT	POTENTIAL SHIP DAMAGE AND SPILL	POTENTIAL HAZARD	POTENTIAL IMPACT ON PUBLIC SAFETY*		
			~250 m	~250 – 750 m	>750 m
Collisions: Low speed	Minor ship damage, no breach	Minor ship damage	Low	Very Low	Very Low
Collisions: High Speed	LNG cargo tank breach from 0.5 to 1.5 m^2 spill area	▪ Small fire ▪ Damage to ship ▪ Vapor Cloud	High Medium High	Medium Low High - Medium	Low Very Low Medium
Grounding: <3 m high object	Minor ship damage, no breach	Minor ship damage	Low	Very Low	Very Low

*Distance to spill origin, varies according to site

Very low – little or no property damage or injuries
Low – minor property damage and minor injuries
Medium – potential for injuries and property damage
High – major injuries and significant damage to structures

5 INTENTIONAL LNG BREACH, SPILL, AND HAZARD ANALYSES

Currently, the potential for an intentional LNG cargo tank breach, the dynamics and dispersion of a large spill, and the hazards of such a spill, are not fully understood, for two primary reasons. First, the combination of LNG ship designs and current safety management practices for LNG transportation have reduced LNG accidents, so that there is little historical or empirical information on large breaches or spills, as discussed in Section 4. Second, for an intentional event, existing experimental data on LNG spill dynamics, dispersion, and burning over water cover spill volumes that are more than two orders of magnitude less than the spill volumes being postulated in many recent studies.

This lack of information forces analysts to make many assumptions and simplifications when calculating the size, dispersion, and thermal hazards of a spill. This section summarizes the modeling and analyses conducted to assess the potential for an intentional LNG breach and the associated hazards to public safety and property from a resulting spill. The detailed results of these analyses are presented in Appendices B – D.

5.1 Analysis of Intentional Breach Scenarios of an LNG Cargo Tank

As in Section 4, available intelligence and historical data were also used to establish a range of potential intentional LNG cargo tank breaches that could be considered credible and possible. This included evaluation of information on insider and hijacking attacks on ships, and external attacks on ships. Again, the level of knowledge, materials, and planning needed to create intentional breaching events was evaluated. Based on this evaluation, explosive shock physics modeling and analysis were used to perform scoping calculations of potential breach sizes for a range of intentional attacks. Details of these evaluations and analyses are presented in Appendix B.

While a discussion of the specific threats and expected consequences is inappropriate for this report, it is appropriate to discuss the range of breaches that were calculated for a wide range of intentional events. A summary of the modeling and analysis efforts developed and conducted to calculate the potential breaches from various intentional scenarios is presented in an associated Classified report [Hightower 2004].

A computational shock physics code, CTH, and material data were used to calculate expected breach sizes for several different intentional scenarios. CTH is a Eulerian finite volume code and is required to estimate and analyze the large-scale deformations and material responses under very high strain rates that might be developed due to high velocity penetration or explosion scenarios.

Based on the scoping analyses for LNG tanker designs, the range of hole sizes calculated from most intentional breaches of an LNG cargo tank is between 2 – 12 m^2. Our analysis suggests that, in most cases, an intentional breaching scenario would not result in a nominal tank breach of more than 5 – 7 m^2. This range is a more appropriate value to use in

calculating potential hazards from spills. Based on the threat it is possible to breach more than one LNG cargo tank during an event.

For both LNG tanker designs, a breach could occur in LNG cargo tanks either above or below the water line. The location impacts the amount of LNG spilled onto the water surface and the amount of LNG that might be spilled into the internal ballast areas between the hulls and vacant hold areas. LNG spilled between the hulls could negatively impact the structural integrity of the tanker or the cargo tanks. Table 13 identifies the level of ship damage from each of the breaching events indicated.

Table 13: Estimated LNG Cargo Tank Breach Sizes for Intentional Scenarios

INTENTIONAL BREACHES		
Breach Size	**Tanks Breached**	**Ship Damage**
0.5 m^2	1	Minor
2 m^2	1	Minor
2 m^2	3	Moderate
12m^2	1	Severe
5 m^2	2	Severe
Premature offloading of LNG	None	Moderate-Severe

Note: *Severe* suggests significant structural damage. Ship might not be able to be moved without significant difficulty and includes potential for cascading damage to other tanks

The intentional breaches and spills shown above include several different events, including a range of potential attacks and insider threats. The large breach sizes calculated, while smaller than commonly assumed in many studies, still provide the potential for large LNG spills. Based on the ranges identified in this study, a nominal breach size of 5 – 7 m^2 was considered. Spill prevention or mitigation techniques should be considered where the consequences or hazards from such breach sizes are most severe.

Table 13 shows that, for many intentional breaching events, the cryogenic damage to the LNG vessel could be minor to moderate, or even severe. Severe structural damage could occur from some of the very large spills caused by intentional breaches. This result is because the volume and rate of the LNG spilled could significantly impact the ship's structural steel. A cascading failure that involves damage to adjacent cryogenic tanks on the ship from the initial damage to one of the LNG cargo tanks is a possibility that cannot be ruled out.

Determination of the potential or likelihood of such an event depends on the breach scenario, the spill location, and any implementation of prevention and mitigation strategies to prevent such an event. In areas where cascading failures might be a significant issue, the use of complex, coupled, thermal, fluid and structural analyses should be considered to improve the analysis of the potential for and extent of structural damage to the LNG ship and other LNG cargo tanks.

5.1.1 Evaluation of the Fire Hazard of an Intentional LNG Spill

In order to determine the general range of hazard levels and to provide a demonstration of how hazard zones can be delineated, the following analysis was performed, the details of which are described in Appendix D.

As stated in Section 4, in most of the scenarios identified, the thermal hazards from an intentional spill are expected to manifest as a pool fire, based on the high probability that an ignition source will be available from most of the events identified. Based on a detailed review of the existing experimental literature presented in Appendix C, nominal fire modeling parameters were used to calculate the expected thermal hazards from a fire for the intentional breach scenarios developed. The same modeling approach and assumptions as discussed in Section 4 were used for these analyses. While the details of the analyses are presented in Appendix D, a summary of these results is shown in Table 14, where the distances to 37.5 kW/m^2 and 5 kW/m^2 are from the center of the pool.

Table 14: Intentional Breach — Effect of Parameter Combinations on Pool Diameter

HOLE SIZE (m^2)	TANKS BREACHED	DISCHARGE COEFFICIENT	BURN RATE (m/s)	SURFACE EMISSIVE POWER (kW/m^2)	POOL DIAMETER (m)	BURN TIME (min)	DISTANCE TO 37.5 kW/m^2 (m)	DISTANCE TO 5 kW/m^2 (m)
2	3	.6	3×10^{-4}	220	209	20	250	784
5	3	.6	3×10^{-4}	220	572	8.1	630	2118
5*	1	.6	3×10^{-4}	220	330	8.1	391	1305
5	1	.9	3×10^{-4}	220	405	5.4	478	1579
5	1	.6	2×10^{-4}	220	395	8.1	454	1538
5	1	.6	3×10^{-4}	350	330	8.1	529	1652
12	1	.6	3×10^{-4}	220	512	3.4	602	1920

*nominal case

The results presented in Table 14 show that the thermal hazards of 37.5 kW/m^2 are expected to occur within approximately 500 m of the spill for most of the scenarios evaluated. For the 2 m^2 three-hole breach, it was assumed that individual pools would form; whereas, for the 5 m^2 three-hole breach, a single pool was assumed to form. The release from the three holes was considered to happen simultaneously. It should be noted that these conditions consider cascading damage resulting from fire or cryogenic-induced failure.

Most of the studies reviewed assume that a single, coherent pool fire can be maintained for very large pool diameters. This would be unlikely due to the inability of air to reach the interior of a fire and maintain combustion on an LNG pool that size. Instead, the flame pool envelope would break up into multiple pool fires (herein: 'flamelets'), the heights of which are much less than the fuel bed diameter used in the calculations by the four previously discussed studies. This breakup into flamelets results in a much shorter flame height than that assumed for a large pool diameter. In reality, L/D (height/pool diameter) would probably be much smaller than that assumed by the correlations in many studies, which predict an L/D ratio between 1.0 and 2.0. A more realistic ratio could be less than 1.0 [Zukoski 1986] [Corlett 1974] [Cox 1985].

Because the heat radiated by the flamelets would be far less than the heat radiation calculated in the many studies (based on a large pool fire), the amount of radiative heat flux that an adjacent object receives would be less, thereby decreasing the size of the thermal hazard zone. As discussed in Appendix D, the use of a mass fire assumption could reduce hazard distances for large spills. The development of fire whirls might increase the hazard zone. Therefore, this type of pool fire model should be carefully considered to improve thermal hazards analysis from potential large spills.

The results presented suggest that the potential thermal hazards for large spills can vary significantly, based on the uncertainty associated with potential spill sizes, dispersion variations, and threats. Based on the estimated pool size for large spills, even with the possibility of reduction in effects for mass fires as opposed to single pool fires, high thermal hazards approaching 37.5 kW/m^2 could probably extend to approximately 500 meters. The thermal hazards between 500 meters and 1600 meters decrease significantly. The hazards would be low, approximately 5 kW/m^2 beyond 1600 m from even a large spill. Based on these observations, approximate hazard zones seem to exist between 0 – 500 m, 500 – 1600 m, and over 1600 m, and were used to develop guidance on managing risks for LNG spills.

5.1.2 Evaluation of Vapor Dispersion Hazard of Intentional LNG Spills

In most of the scenarios identified, the thermal hazards from a spill are expected to manifest as a pool fire, based on the high probability that an ignition source will be available from most of the events identified. In some instances, such as an intentional spill without a tank breach, an immediate ignition source might not be available and the spilled LNG could, therefore, disperse as a vapor cloud. For large spills, the vapor cloud could extend to more than 1600 m, depending on spill location and site atmospheric conditions. In congested or highly populated areas, an ignition source would be likely, as opposed to remote areas, in which an ignition source might be less likely.

As mentioned in Section 4, the impact from a vapor cloud dispersion and ignition from a large spill can extend beyond 1600 meters, based on our review of external data discussed in Appendix C. This suggests that LNG vapor dispersion analysis should be conducted using site-specific atmospheric conditions, location topography, and ship operations to assess adequately the potential areas and levels of hazards to public safety and property. Consideration of risk mitigation measures, such as development of procedures to quickly ignite a dispersion cloud and stem the leak, if conditions exist that the cloud would impact critical areas.

If ignited close to the spill, and early in the spill, the thermal loading from the vapor cloud ignition might not be significantly different from a pool fire, because the ignited vapor cloud would burn back to the source of liquid LNG and transition into a pool fire. If a large vapor cloud formed, the flame could propagate downwind, as well as back to the source. If the cloud is ignited at a significant distance from the spill, the thermal hazard zones can be extended significantly. The thermal radiation from the ignition of a vapor cloud can be very high within the ignited cloud and, therefore, particularly hazardous to people.

In order to obtain LNG dispersion distances to LFL for intentional events, calculations were performed using VULCAN, as discussed in Section 4. A low wind speed and highly stable

atmospheric condition were chosen because this state has shown to result in the greatest distances to LFL from experiment, and thus should be the most conservative. A wind speed of 2.33 m/s at 10 m above ground and an F stability class were used for these simulations. For intentional events, two cases were run, one for the nominal case of a 5-m^2 hole and one tank breach, and the other for a 5-m^2 hole and three tanks breached. This case is the largest spill; hence, it should give the greatest LFL for intentional events. As indicated in Table 15, the dispersion distance to LFL for intentional events might extend from nominally 2500 m to a conservative maximum distance of 3500 m for this unlikely event.

While previous studies have addressed the vapor dispersion issue from a consequence standpoint only, the risk analysis performed as part of this study indicates that the potential for a large vapor dispersion from an intentional breach is highly unlikely. This is due to the high probability that an ignition source will be available for many of the initiating events identified, and because certain risk reduction techniques can be applied to prevent or mitigate the initiating events identified. The significant distances, though, of a potential vapor dispersion suggest that LNG vapor dispersion analysis and risk mitigation measures should be carefully considered to protect adequately both the public and property.

Table 15: Dispersion Distances to LFL for Intentional Spills

HOLE SIZE (m^2)	TANKS BREACHED	POOL DIAMETER (m)	SPILL DURATION (min)	DISTANCE TO LFL (m)
5	1	330	8.1	2450
5	3	572	8.1	3614

The analyses from the fire and vapor dispersion calculations suggest that high thermal hazards from intentional events extend significantly from the spill location. Table 16 summarizes the general impacts on both public safety and property for intentional breaches and spills. In this table, high impact would include a thermal intensity in the range of 37.5 kW/m^2 and low values would correspond to thermal intensities in the range of 5 kW/m^2.

These results should be used as guidance, bearing in mind that these distances will vary, based on site-specific factors and environmental conditions.

Table 16: Estimated Impact of Intentional LNG Breaches & Spills on Public Safety & Property

EVENT	POTENTIAL SHIP DAMAGE AND SPILL	POTENTIAL HAZARD	POTENTIAL IMPACT ON PUBLIC SAFETY[a]		
			~500 m	~500 – 1600 m	>1600 m
Insider Threat or Hijacking	Intentional, 2-7 m^2 breach and medium to large spill	▪ Large fire	High	Medium	Low
		▪ Damage to ship	High	Medium	Low
		▪ Fireball	Medium	Low	Very Low
	Intentional, large release of LNG	▪ Large fire	High	Medium	Low
		▪ Damage to ship	High	Medium	Low
		▪ Vapor cloud fire	High	High - Med	Medium
Attack on Ship	Intentional, 2-12m^2 breach and medium to large spill	▪ Large fire	High	Medium	Low
		▪ Damage to ship	High	Medium	Low
		▪ Fireball	Medium	Low	Very Low

[a] Distance to spill origin, varies according to site

Very low – little or no property damage or injuries
Low – minor property damage and minor injuries
Medium –potential for injuries and property damage
High – major injuries and significant damage to structures

6 RISK REDUCTION STRATEGIES

A customized, risk management approach is necessary because every LNG site has unique features. Performance-based safety requirements are often used in instances where there is a lack of good information on operational consequences or hazards. In many cases, safety information does exist and, based on available data, prescriptive safety requirements described by codes, standards, or other regulations are often developed and recommended. For combined safety and security applications, where threats can change or grow rapidly, performance-based regulations and strategies can often provide the flexibility needed to respond to the evolving security and safety needs.

To obtain the most complete picture of the potential consequences in a given breach scenario, a target-mechanism-consequence model is suggested. The target is the vulnerable element on which some mechanism acts to produce an undesired consequence. For example, a private residence (target) on a nearby shore can be ignited by radiant energy from a burning LNG spill (mechanism) that might lead to loss of property (consequence). Following the example, an LNG spill might trace to a number of causes, such as structural insult or premature off-loading of LNG. This section identifies some targets, mechanisms, and consequences that might be useful in developing approaches to manage risks at existing or future LNG terminal sites.

6.1 Target – Mechanism – Consequence Model

<u>Target</u>

Targets are usually identified as physical objects or subsystems, but people (operators, residents, etc.) are targets as well.

Table 17: Targets Table

TARGETS AFLOAT	FIXED TARGETS IN WATER	TARGETS ASHORE
LNG tanker	Bridge	LNG storage terminal
Other tanker (e.g., gasoline)	Tunnel	Adjacent industry
Security escort	LNG terminal or other pier	Residential & business districts
Rescue vessel	Ship channel	Roadways
Pleasure boat	Oil rig	Airport

Mechanism

Failure mechanisms can be either accidental or intentional; and they can be categorized under physical, cyber and communications, and interpersonal.

Table 18: Mechanisms Table

PHYSICAL	CYBER AND COMMUNICATIONS	INTERPERSONAL
Collisions & other impacts	On-ship communications	Sabotage
Brittle fracture (cryogenic)	On-ship control	Espionage
Bulk explosions	Harbor master communications	Infiltration
Directed explosions (shaped charge)	Process control and data acquisition systems	Subversion
Fire dynamics	Ship to ship and ship to shore communications	Diversion
Cryogenic liquid dynamics	Tactical and emergency communication systems	Hiding

Consequence

Intentional mechanisms (deliberate acts) can often produce greater consequences than accidental mechanisms because the perpetrator can maximize the effects of an attack by choosing the time and place. In fact, the perpetrator might coordinate several, simultaneous attacks, thus compounding the consequences. Consequences can include local, cascading, and delayed effects. All these effects must be considered in developing an overall risk reduction and risk management approach.

Table 19: Consequences Table

LOCAL	CASCADING	DELAYED
Death or injury to tanker crew	Death or injury to escort vessel crews	Death or injury to rescue vessel crews
Damage or loss of LNG vessel	Damage or loss of escort vessels	Disruption of future LNG deliveries
Blockage of waterway	Hold on operations at other waterways	Denial of future operations at other waterways
Fire damage to nearby structures or infrastructures	Loss of use of other infra-structures	Denial of future operations at receiving terminal
Public deaths and/or injuries	Public deaths and/or injuries	Loss of use of infrastructures or properties
	Economic losses	Economic losses and loss of energy supplies

6.2 Risk Management Strategies: Prevention and Mitigation

Many factors can impact risks to public safety and property from an LNG spill: design, materials selection, manufacturing methods, inspection and testing, assembly techniques, worker training, and safety operations, among others. For example, two ship design features that can impact risk are hull type (single vs. double) and hull material (steel vs. a more exotic material). Other significant factors include terminal location and design, port handling elements (e.g., tugboats and firefighting equipment), communications systems, and emergency response capabilities.

It is important to realize that a decision involving large capital expense can have long-lasting effects (e.g., LNG terminal site selection). For this reason, it is imperative to consider carefully all risk management decisions in order that residual or future risks can be managed to an acceptable level.

In general, risk can be managed by prevention or mitigation. Prevention seeks to avoid an accident or attack; mitigation reduces the effects of an accident or attack. Table 20 provides some general strategies for prevention and mitigation. Combinations of these types of strategies can improve both safety and security involving either accidental or intentional incidents.

While the prevention and mitigation strategies identified in the table are possible, many might not be cost-effective or even practical in certain locations or applications. Risk management should be based on developing or combining approaches that can be effectively and efficiently implemented to reduce hazards to acceptable levels in a cost-effective manner.

This type of approach has been in use and is in use by the LNG industry, the Coast Guard, and public safety organizations to ensure the safety of the transportation of LNG. These efforts include a number of design, construction, safety equipment, and operational efforts to reduce the potential for an LNG spill. Existing safety and security efforts for LNG vessels are noted following Table 20 [Scott 2004].

Regardless, all LNG vessels that enter the U.S. must meet both domestic regulations and international requirements. Domestic regulations for LNG vessels were developed in the 1970's under the authority of the various vessel inspection statutes now codified under Title 46 of the United States Code, which specifies requirements for a vessel's design, construction, equipment, and operation. These regulations closely parallel international LNG requirements; but are more stringent in the following areas: the requirements for enhanced grades of steel for crack-arresting purposes in certain areas of the hull, specification of higher allowable stress factors for certain independent type tanks, and prohibition of cargo venting as a means of regulating cargo temperature or pressure.

Table 20: Prevention and Mitigation Strategies

PREVENTION	MITIGATION
ISOLATION ▪ physical separation (distance) ▪ physical barriers ▪ keep-out or exclusion zones (buffers) ▪ interrupted operations (aircraft, bridge traffic)	RECOVERY OPERATIONS ▪ plans in place & current ▪ equipment & people in place & ready ▪ drills ▪ evacuation plans
VOID SPACES WITH INERT GAS	MAINTAIN MOBILITY (tanker + towing)
INERTING OF VOID SPACES	LIMIT SPILL AMOUNTS & RATES
VARIED TIMES OF OPERATIONS	SECURITY EMERGENCY RESPONSE FORCES
INTELLIGENCE ▪ communication links in place & ready ▪ timely updates ▪ interagency communication links	FIRE-FIGHTING CAPABILITIES ▪ leak detectors ▪ deluge systems ▪ radiant barriers (high-pressure high-density foam systems) ▪ backup fire fighting capabilities
INCREASED MOBILITY (tugs)	REDUNDANT MOORING & OFFLOADING CAPABILITIES
ARMED SECURITY ESCORT (boat, aircraft or on-board)	OFFSHORE MOORING & OFFLOADING CAPABILITIES
SWEEPS (divers, sonar, U.S.CG boarding)	SPEED LIMITS
SURVEILLANCE (on-ship, on-land, underwater & aerial)	CRYOGENICALLY-HARDENED VESSEL
EMPLOYEE BACKGROUND CHECKS	SHIP ARMOR, ENERGY-ABSORBING BLANKETS
TANKER ACCESS CONTROL PROGRAM	MISSILE DEFENSE SYSTEM
STORM PREDICTION & AVOIDANCE PLANS	REDUNDANT CONTROL SYSTEMS
SAFETY INTERLOCKS	BACKUP FUEL SOURCE (oil)

All LNG vessels in international service must comply with the major maritime treaties agreed to by the International Maritime Organization (IMO), such as the International Convention for the Safety of Life at Sea, popularly known as the "SOLAS Convention," and the International Convention for the Prevention of Pollution from Ships, known as the "MARPOL Convention." In addition, LNG vessels must comply with the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, known as the "IGC Code."

Before being allowed to trade in the United States, operators of LNG carriers must submit detailed vessel plans and other information to the Coast Guard's Marine Safety Center (MSC) to establish that the vessel has been constructed to the higher standards required by U.S. regulations. Upon satisfactory plan review and on-site verification by Coast Guard marine inspectors, the vessel is issued a Certificate of Compliance. The Certificate of Compliance is valid for a two-year period, subject to an annual examination by Coast Guard marine inspectors, who verify that the vessel remains in compliance with all applicable requirements.

Because of the safety and security challenges posed by transporting millions of gallons of LNG, vessels typically undergo a more frequent and rigorous examination process than conventional crude oil or product tankers. LNG vessels are boarded by marine safety personnel prior to U.S. port entry to verify the proper operation of key navigation, safety, fire fighting, and cargo control systems.

LNG vessels are subject to additional security measures. Many of the security precautions for LNG vessels are derived from analysis of "conventional" navigation safety risks, such as groundings, collisions, propulsion, and steering system failures. These precautions pre-date the events of September 11, 2001, and include such items as traffic control measures for special vessels that are implemented when an LNG vessel is transiting or approaching a port and security zones around the vessel to prevent other vessels from approaching it. Also included are escorts by Coast Guard patrol craft and, as local conditions warrant, coordination with other Federal, State and local transportation, law enforcement and/or emergency management agencies to reduce the risks to, or reduce the interference from, other port area infrastructures or activities. All such measures are conducted under the authority of existing port safety and security statutes, such as the Magnuson Act (50 U.S.C. 191 et. seq.) and the Ports and Waterways Safety Act.

Since September 11, 2001, additional security measures have been implemented, including the requirement that all vessels calling in the U.S. must provide the Coast Guard with a 96-hour advance notice of arrival (increased from 24 hours advance notice, pre-9/11). This notice includes information on the vessel's last ports of call, crew identities, and cargo information. Based on vessel-specific information, the Coast Guard conducts at-sea boardings, in which Coast Guard personnel conduct special "security sweeps" of the vessel and ensure that "positive control" of the vessel is maintained throughout its port transit. This is in addition to the safety-oriented boardings previously described.

One of the most important post-9/11 maritime security developments has been the passage of the Maritime Transportation Security Act of 2002 (MTSA). Under the authority of MTSA, the Coast Guard has developed new security measures applicable to vessels, marine facilities, and maritime personnel. The domestic maritime security regime is closely aligned with the International Ship and Port Facility Security (ISPS) Code. Under the ISPS Code, vessels in international service, including LNG vessels, must have an International Ship Security Certificate (ISSC). To be issued an ISSC, the vessel must develop and implement a threat-scalable security plan that establishes access control measures, security measures for cargo handling and delivery of ships stores, surveillance and monitoring, security communications, security incident procedures, and training and drill requirements. The plan must also identify a Ship Security Officer who is responsible for ensuring compliance with the ship's security plan.

For an LNG terminal, regulations developed under the authority of the Ports and Waterways Safety Act assign to the Coast Guard the responsibility for safety issues within the "marine transfer area" of LNG terminals. The "marine transfer area" is defined as that part of a waterfront facility between the vessel, or where the vessel moors, and the first shutoff valve on the pipeline immediately before the receiving tanks. Safety issues within the marine transfer area include electrical power systems, lighting, communications, transfer hoses and piping systems, gas detection systems and alarms, firefighting equipment, and operations such as approval of the terminal's Operations and Emergency Manuals and personnel training.

New maritime security regulations have been recently developed for terminal facilities. These regulations require the LNG terminal operator to conduct a facility security assessment and develop a threat-scalable security plan that addresses the risks identified in the

assessment. Much like the requirements prescribed for vessels, the facility security plan establishes access control measures, security measures for cargo handling and delivery of supplies, surveillance and monitoring, security communications, security incident procedures, and training and drill requirements.

6.3 Risk Reduction Examples

Table 21 below presents selected scenarios that provide examples of potential events and several prevention and mitigation approaches that could be used to reduce risks to public safety and property. Following the table, examples are given for each category of how these prevention and mitigation strategies can be implemented individually or in combination to reduce risks and consequences for a given location.

Many of the strategies identified are already under consideration or being implemented by the Coast Guard. Other strategies identified might be considered in conjunction with existing strategies at many sites. While risks can seldom be reduced to zero, prevention of the higher consequence events can significantly reduce hazards to public safety and property and facilitate mitigation of the remaining lower consequence and lower risk events.

As discussed in Section 3, prevention and mitigation strategy implementation should key on effectiveness, costs, and operational impacts. The level of risk reduction required should be determined in conjunction with local public officials and public safety organizations such as police and fire departments, emergency response services, port authorities, the Coast Guard, and other appropriate stakeholders.

Risk reduction strategies that are effective at one site might not be effective at another site. Therefore, the examples provided in Table 21 below should be considered in the context of how a risk management approach might be customized to yield benefits to public safety and property while having limited operational impacts.

Table 21: Examples of Risk Prevention and Mitigation Strategies for Potential Threats

SCENARIO	TARGETS	MECHANISM	POTENTIAL CONSEQUENCES		RISK REDUCTION MEASURES	
			LOCAL	CASCADING	PREVENTION	MITIGATION
Ramming	Fixed targets afloat or ashore	Mechanical distortion	Fire & ship damage	Large-scale fire	▪ Control of ship ▪ Increased mobility ▪ Tug escort	▪ Absorbing barriers on fixed targets ▪ Fire-fighting capability
Triggered Explosion	Fixed targets afloat	Pre-placed, coordinated explosion	Ship damage	Large-scale fire, blockage of waterway	▪ Early interdiction and surveillance ▪ Sweeping ▪ Intelligence ▪ Control of ship	▪ Emergency response force ▪ Evacuation plans ▪ Towing option
Insider Takeover or Hijacking	Fixed targets afloat or ashore	Standoff & negotiation, or explosion	Elevated public concern or fire & ship damage	Public demands to cease operations or large-scale fire	▪ Early interdiction & searches ▪ Control of ship ▪ Employee background checks	▪ Emergency response force ▪ Evacuation plans
Terrorist	Target afloat	Vessel carrying explosives	Fire & ship damage	Large-scale fire and blockage of waterway	▪ Security zones ▪ Safety halo around ship ▪ Intelligence	▪ Emergency response force ▪ Evacuation plans ▪ Towing option

Ramming

Ramming could occur between an LNG tanker and a fixed object or between a boat and an LNG tanker. As noted in Appendix B, unless the LNG tanker speed is above 5 – 7 knots or the object is very sharp, ramming of the LNG tanker into an object will not likely penetrate both hulls and the LNG cargo tank. Likewise, if the LNG tanker is rammed by a small boat, such as a pleasure craft, the kinetic energy is insufficient to penetrate the inner hull of a double-hulled LNG ship.

Therefore, while ramming does not appear to be a major concern or present significant hazards, changes in some safety and security operations could reduce the chances of a ramming event. For example, requiring tug escorts for LNG ships in high consequence areas would reduce the potential for an insider to ram intentionally an LNG vessel into a critical infrastructure element. Another option would be to ensure that crewmembers have been properly evaluated and the ship interdicted and searched sufficiently in advance of entry into the U.S. to thwart a hijacking attempt or insider sabotage. These efforts reduce the ability of an adversary to pick the time, place, and target for a ramming event and reduce the risk from a potential ramming scenario.

Triggered Explosion

Triggered explosion events assume pre-placed explosives, either on the ship or in a fixed location. At some sites, sweeping of the waterway, harbor bottom, and terminal areas for explosives or mines might be required. This is especially true for high hazard areas, shallow waterways, or terminals where explosives might be hidden. To prevent sabotage of an LNG cargo tank through a triggered explosive on board a ship, the same type of early interdiction, searches, and control of the ship discussed in the ramming prevention scenario could be applicable.

Insider Takeover or Hijacking

A number of security measures, including armed security control aboard the ship and early interdiction and inspection of the ship prior to its entry into the U.S., could prevent many of the large breaching scenarios identified in Sections 4 and 5. This could significantly reduce hazards levels and enable spill mitigation measures available to emergency response organizations to be used effectively.

A ship hijacking should be considered credible through coordinated efforts by insiders or others. The threat could proceed with the breach and spill of an LNG cargo tank through use of planted or smuggled explosives or by overriding offloading system safety interlocks to discharge LNG intentionally onto the ship, onto unloading terminal equipment, or onto the water. While a number of operational procedures have been implemented to help prevent this type of potential scenario, control and surveillance of an LNG ship must be appropriately maintained to ensure adequate time to respond to a potential hijacking event.

External Terrorist Actions

External terrorist attacks could come from a number of avenues, including attack of the LNG ship with a wide range of munitions or bulk explosives. A U.S.S Cole-type attack is often suggested as a potential attack scenario, as well as attacks with munitions such as rocket-propelled grenades, or missiles or attacks by planes. Depending on the size of the weapon or explosive charge and the location of the attack, the potential breach and LNG spill will vary.

Common approaches to prevent or mitigate these events are to make structures more resistant to attacks or to increase the standoff distance between the initiation of explosives and the ship. While security zones are presently used effectively for safety considerations at most of the LNG import locations in the U.S., a security halo for an LNG ship would have to be much smaller and effectively maintained to develop the security zones needed to prevent some of these events. Such measures could prevent a potential attacker from approaching close enough to cause severe damage to an LNG vessel. This security zone might require different escort ships and escort procedures, improved overhead and subsurface surveillance, enhanced training, or enhanced security response procedures.

6.4 Recommended Focus for Risk Prevention

The threats considered and the safety and security measures employed to address them must be based on site-specific and location-specific conditions. The level of risk prevention or mitigation required will depend on the site and its location relative to major population areas and critical infrastructures. In all cases, the risk reduction strategies identified should be

considered from a cost-effectiveness viewpoint; i.e. reducing risks to acceptable levels in the most cost-effective manner possible for a given site and location.

To guide risk management efforts and reduce impact on operations, Sandia recommends defining threat-scalable safety and security measures, and then tying safety and security related operations to these levels, which is the approach taken by the Department of Homeland Security for its threat advisory system. In this way, for each threat condition, protection and operations changes can be implemented in order to maintain the level of risk to public health and safety at acceptable levels.

Although the Department of Homeland Security defines threat levels, this might or might not be appropriate for an LNG transport system. As a minimum, Sandia suggests three levels — normal, off normal, and emergency. Unlike Homeland, whose sole focus is security, LNG would extend this formalism both to security and to safety.

Generally, the safety efforts currently in place for LNG transportation over water have been very effective in preventing accidents and appear to be adequate. At some locations, however, security efforts required to prevent intentional breaching events might have to be increased in order to reduce the risks to public health and safety. Since 9/11, current safety and security efforts have been increased and are continuing to evolve to meet the challenges of ever changing security threats.

As shown in Tables 20 and 21, multiple security strategies are available to help prevent or mitigate these events and often are complementary with existing LNG safety strategies already in practice. Suggested general security improvements to address the three major intentional breach scenarios should account for site-specific conditions and hazards and include (as required):

- Appropriate off-shore LNG ship interdiction and inspections for explosives, hazardous materials, and proper operation of safety systems;
- Appropriate monitoring and control of LNG ships when entering U.S. waters and protection of harbor pilots and crews;
- Enhanced safety zones around LNG vessels (safety halo) that can be enforced;
- Appropriate control of airspace over LNG ships; and
- Appropriate inspection and protection of terminal areas, tug operations prior to delivery and unloading operations.

Effective implementation of these types of security measures, along with complementary measures such as improved intelligence and cooperation, could reduce the potential for several types of intentional events. (The types of measures needed to reduce specific threats are discussed in more detail in an associated classified report [Hightower 2004].
A reduction in threats would reduce the potential sizes of breaches, and associated spills and hazards. This could significantly reduce the risks to people and property from an LNG spill over water.

Before implementation of specific safety or security measures is contemplated at a site, a baseline risk analysis should be conducted, a minimum acceptable risk estimated, and

vulnerabilities and hazards evaluated. After the initial risk analysis has been completed, prevention and mitigation measures or strategies can then be considered and evaluated. These can then be compared to assess if they provide the enhancements required to reduce the risks of an LNG spill to acceptable levels for a site.

6.5 Application of the Risk Management Process

So far, in this section we have discussed risk reduction for areas or activities within the larger system that includes the LNG tanker, the waterways it travels, and neighboring infrastructures. We used the risk management guidance and safety information developed in this report to assess ways to enhance operations and reduce the potential risks to the public. Hopefully, this will provide the reader with suggestions on how to consider various issues, including terminal location and site conditions, operational conditions, environmental effects, and safety and security concerns and measures. To be feasible, such a process must be effective from a surety standpoint, affordable, possible to implement in a timely fashion, minimize environmental impact, and be otherwise amenable to regulators and stakeholders.

We are not intending to suggest a "cookbook" methodology for selecting new sites; however, we want the reader to understand what type of issues should be considered and what various measures should be applied to try to achieve appropriate levels of protection of public safety and property for LNG imports.

Applying the Risk Management Process to LNG Imports

Risk management of an LNG import facility should be viewed as a system that includes the LNG tanker, the import terminal facilities and location, the navigational path, and the nearest neighbors along the navigational path and at the import terminal. Four classes of attributes affect the overall risks. These include:

- The context of the import facility – location, site specific conditions, LNG import, importance to the region;
- Potential targets and threats – potential accidental events, credible intentional events, and ship or infrastructure targets;
- Risk management goals– identification of levels of consequences to be avoided, such as injuries and property damage, LNG supply reliability required; and
- Protection system capabilities – LNG tanker safety and security measures, LNG import operations safety and security measures, and early warning and emergency response/recovery measures.

In the risk management process shown in Figure 3, the four attributes discussed are then evaluated to determine if the protection system in place can effectively meet the risk management goals identified for a specific import terminal site and operations. If so, then the safety and security measures and operations developed for the LNG import operations are adequate. Import operations should be reviewed on a regular basis to assess whether changes in context, targets or threats, risk management goals or risk management systems have changed such that a reassessment of risks is needed.

If the initial risk assessment determines that the identified risk management goals are not being met, then potential modifications in location and site conditions, import operations, safety and security measures, emergency response and early warning measures should be assessed to determine effective improvements in the overall risk management system Below,

we provide a summary of the elements that should be considered for LNG import facility applications for each step of the risk management process identified in Figure 3 of this report. These steps provide a context of how the safety analysis and risk guidance provided in this report can be used to evaluate options to protect property and public health and safety associated with LNG import terminals and operations.

<u>Step One</u> - Characterize Assets

In this step, the context of the LNG facility such as location, site-specific conditions, and nominal operations should be identified and developed. Information that should be collected and considered includes:

- **Type and Proximity of Neighbors (Sections 3.3, 4.2, and 5.1)**

  -Distance to residential, commercial, and industrial facilities or other critical infrastructures such as bridges or tunnels, and

  -Transit – Near or in major ship channel or remote from channel

- **Environmental Conditions (Sections 3.2 and 3.3)**

  -Wind-driven Spill Movement & Dispersion – prevailing wind direction, speed, and variability,

  -Severe Weather Considerations – hurricanes, storm surges,

  -Tidal-driven Spill Movement & Dispersion – height, current, and influence on spill movement and dispersion,

  -Seismic issues - ground displacement, soil liquefaction, and

  -Temperature issues – ice, thermal impediment to operations

- **Nominal Operational Conditions (Sections 2.1, 2.2, and 3.3)**

  -LNG tanker size and design,

  -Expected frequency of shipments,

  -Importance of LNG Shipments – Available storage, seasonal demands, percentage of regional or local supply, and

  -Transit – additional traffic (near other large ships, pleasure boats) and distance to it; transit near critical infrastructures, such as other terminals, commercial areas, or residential areas; number of critical facilities along transit; distance to critical facilities along transit.

<u>Step Two</u> – Identify Potential Threats (Sections 4.1 and 5.1)

In this step, the potential or likely threats expected for the facility, based on site location and relative attractiveness of either an LNG tanker or other nearby targets, should be identified.

- **Accidental Event Considerations** – shipping patterns, frequency of other large ships, major objects or abutments to be avoided, warning systems, weather impacts on waterways or operations,
- **Intentional Event Considerations** – threat levels identified by Homeland Security, identified threats, past threats and shipping attacks, difficulty of attack scenarios for a given site, and

- **Attractiveness of Targets** – impact of LNG tanker attack, impact on facilities near navigational route, impact on other facilities near site not associated with LNG operations.

<u>Step Three</u> **- Determine Risk Management Goals and Consequence Levels (Section 6.1)**

Identify risk management goals or consequence levels for LNG operations, including potential property damage and public safety (including injury limits). Setting of the goals and levels would be conducted in cooperation with stakeholders, public officials, and public safety officials. Consideration should be given to evaluating a range of potential risk management goals and consequence levels. In this way, an assessment of the range of potential costs, complexity, and needs for different risk management options can be compared and contrasted. Common risk management goals and consequence level considerations should include:

- Allowable duration of a loss of service, ease of recovery,
- Economic impact of a loss of service,
- Damage to property and capital losses from a spill and loss of service, and
- Impact on public safety from a spill – potential injuries, deaths.

<u>Step Four</u> **- Define Safeguards and Risk Management System Elements (Section 6.2)**

This step includes identifying all of the potential safety and security elements and operations available on the LNG tanker, at the terminal, or in transit. They include not only safety features but also safety and security-related operations and emergency response and recovery capabilities. These include:

- **Operational Prevention and Mitigation Considerations**

  -LNG tanker safety/security features,

  -Proximity and availability of emergency support – escorts, emergency response, fire, medical and law enforcement capabilities,

  -Early warning systems,

  -Ship interdiction and inspection operations and security forces, and

  -Ability to interrupt operations in adverse conditions – weather, wind, waves.

- **Protective Design**

  -Design for storm surges, blasts, thermal loading,

  -Security measures – fences, surveillance, exclusion areas,

  -Effective standoff from residential, commercial, or other critical infrastructures based on recommended hazard distances from an LNG spill over water, and

  -Redundant offloading capabilities.

Step Five - **Analyze System and Assess Risks (Sections 3.3, 4.2, and 5.1)**

In this step, the defined risk management goals and consequence levels should be compared to the existing system safeguards and protective measures. This effort would include evaluation of each element of the event tree identified in Figure 4 for a potential spill that might occur for the site-specific conditions, threats, and calculated hazard distances and hazard levels.

If the system safeguards in place provide protection of public safety and property that meet risk management goals, then the overall risks of an LNG spill would be considered compatible with public safety and property goals. The risk management process should be updated regularly to assess whether changes in threats or threat levels, operations, LNG tanker design, or protective measures have occurred that would impact the ability of the system safeguards to meet identified or improved public health and safety goals.

Step Six – **Assess Risk Prevention and Mitigation Techniques (Sections 6.2 and 6.3)**

If the potential hazard distances and hazard levels calculated exceed the consequence levels and risk management goals for the LNG terminal and import operations, then the enhanced risk mitigation and prevention strategies identified in Table 20 should be considered. While many of the options listed would be possible for a given site, developing approaches or combinations of approaches should be considered that can be effectively and efficiently implemented and that provide the level of protection, safety, and security identified for the LNG operations at each site.

7 GUIDANCE: SAFETY AND RISK ANALYSIS AND RECOMMENDATIONS

As discussed throughout this report, several major issues are associated with the potential for a large LNG spill over water. They include the potential for an accidental or intentional act that could cause an LNG spill, evaluation of the dynamics of the potential spill and LNG dispersion, the potential consequences that might occur from the range of spills, and strategies or efforts that might be employed to either prevent or mitigate the risks of a spill. Because costs to prevent and mitigate the potential consequences of an extreme event such as an LNG spill can be extensive, performance-based risk management approaches can be used to ensure that public safety and property are effectively protected.

In this study, a risk management approach is suggested for reducing the risks of LNG spills over water. Such an approach provides a systematic method for considering the potential of a breach event, assessing the expected LNG dispersion and potential consequences, and identifying prevention and mitigation strategies to reduce risks for site-specific conditions. Using available ship and experimental data, Sandia was able to evaluate both accidental and intentional breach scenarios of an LNG cargo tank. These efforts included assessments of past LNG spill and dispersion testing and modeling, estimates of hazards from an LNG spill, and identification of approaches to prevent or mitigate large LNG spills over water.

Modeling and assessing the impacts of potentially large LNG spills over water is a challenge that would benefit from additional, large-scale experiments to validate analysis techniques and approaches. These efforts would help reduce the uncertainty and improve the accuracy in assessing the impact and associated consequences of large LNG spills over water. Additional testing might best be conducted as part of a joint public/private effort with industry and government agencies to ensure widespread acceptance and support.

7.1 Guidance: Using Models for Spill and Hazard Evaluations

A detailed review of LNG dispersion and fire modeling methods and approaches suggests that current computational models require many assumptions. Table 22 shows the impact different parameters have on a consequences or hazards analysis. The table should be used as guidance on the level of detail needed in evaluating hazards from an LNG spill. Major categories that need to be included are:

- Identification of hole size, location, and ignition conditions,
- Inclusion of site specific conditions - wind, topography, waves, currents, structural interactions,
- Fuel spill and spread assumptions, and
- Gas dispersion assumptions with wind conditions, terrain, and obstacle considerations

Analyses that do not include these categories will not be able to identify accurately the risks and hazards to public safety and property.

A wide range of simplified models and approaches exists, and the applicability to LNG spills and comparisons with LNG spill data has been previously conducted, as discussed in

Appendix C. While these studies provide insight into the appropriate models to use, several additional factors should be considered in applying these models to a specific problem. These include:

- Model documentation and support – assumptions and limitations, comparison with data, model change control and upgrade information, and user support;
- Appropriate modeling of the physics of a spill – time-varying spill and dispersion analysis, vapor and pool ignition and burning, and water and fire impact on LNG spill spread and vaporization;
- Modeling of the influence of environmental conditions (wind, waves, water current, air, and water temperature, and humidity) on liquid and vapor dispersion, flame tilt, and spill and fire dynamics; and
- Peer review of applications of models, and peer review of the applications of the models.

By considering these factors, many existing models and tools can be used in many cases to provide adequate, general guidance on potential hazards associated with an LNG spill over water.

The fire hazards addressed in this study have been evaluated using integral or similarity models that can be readily applied in practice. Simplified models with the appropriate input parameters can be used with reasonable confidence for calculating the heat flux to objects at a long distance (more than the LNG pool diameter) from a fire that is not heavily influenced by nearby structures [Gritzo and Nicolette, 1997]. Under such conditions, the main uncertainties in the simplified models are due to 1) the inability of these models to represent fires at very large (50 m or more in diameter) scales, and 2) uncertainty in the input parameters required by these models.

Where an analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain, buildings, or structures can occur, modern, validated, CFD models can be applied to assess spill, dispersion, vaporization, and fire hazards to improve analysis of site-specific conditions. CFD models solve the fluid dynamics equations, coupled with the reacting flow properties that result in the thermal hazard posed by fires. Rather than treating the shape of the flames as cylindrical (as assumed by simple or integral models), validated CFD-based techniques predict the flame shape as influenced by adjacent objects and structures. Comparison with experimental data indicates that the point source model and the solid flame model do not accurately predict heat flux levels when the pool is non-uniform, such as would occur when there is object interaction. As such, CFDs are better able to provide predictions of the heat flux to engulfed structures and, therefore, can be used to analyze cascading effects where hazards might induce additional failures and subsequent fire hazards. Because they include additional physics, fewer input parameters are required and, once validated, they can better represent fires at very large scales.

Table 22: **Importance of Parameters/Assumptions for Assessing LNG Spills/Fires/Explosions**

ASSESSMENT OF SCENARIO	ESTIMATED IMPACT ON HAZARDS
Specification Of Initial Conditions	
Hole size and location	High
Ignition potential	High
Specification Of Boundary Conditions	
Wind/atmospheric conditions	High
Topography of site	High
Pool surface and properties (waves, thermodynamic properties, etc.)	High
Nearby structures	Med
Modeling Assumptions And Features	
Fuel spill	Med
Simple hole	Med
Vaporization enhanced by turbulence mixing	Med-High
Spread Model: smooth surface	High
Spread Model: fuel composition	Med-Low
Spread Model: atmospheric conditions	High
Spread Model: RPT	Med
Dispersion	
Dense gas	High
Under vs. above water release	High
Atmospheric conditions	High
Terrain/obstacles	High
Ignition	
Fuel composition	High
Ignition time of event (from puncture or impact)	High
Fire	
Burning rate	Med-High
Surface emissive power	High
Flame shape at large scale	High
Obstacles	High
Atmospheric conditions	High
Fuel composition	High

Detailed models require more computational capability and user expertise; therefore, they are less desirable for widespread application. However, validated, detailed models can be used to develop correction factors for simplified models that can, in turn, be widely employed with confidence to assess hazards. These tools can also be used to explore the potential passive (such as vapor barriers or firebreaks) or active (such as water spray) mitigation techniques.

Development of validated CFD models will require implementation of equations to represent phenomena, including: 1) the dynamics of cryogenic liquids, including evaporation and spread on water, and 2) the mixing and burning of low temperature natural gas vapor in very large plumes. These models must be verified (i.e. ensure that the equations are being solved

correctly) and validated (i.e. ensure that the right equations are being solved for the application of interest) through analysis efforts and comparisons with high quality data.

Validation of detailed models for LNG applications is beyond the scope of this study; but such models have been applied in numerous other cases to evaluate large fire hazards from liquid hydrocarbons such as jet fuel [Gritzo and Nicolette 1997] [Suo-Antilla and Gritzo 2001] [Gritzo and Nicolette 1998]. The essential features of the validation process have been documented in the literature [Gritzo et al., 2004].

Our evaluation suggests that modern, validated CFD models should be further refined and used as appropriate to improve site-specific thermal hazard and consequence analyses where interaction with terrain, buildings, or other structures might occur. Table 23 presents various, CFD models that could be used for the listed applications. These types of models can address complex geometries, and include additional physical modeling capabilities that allows them to be more easily extrapolated to larger spills.

Table 23: Suggested Models for Enhanced Spill, Dispersion, and Fire Dynamics Analyses

APPLICATION	SUGGESTED MODELS & APPLICATIONS
Tank Emptying	Modified orifice model that includes the potential for LNG leakage between hulls
Spreading	Free-surface CFD code (e.g. application extension of FLOW-3D, STORM/CFD2000)
Dispersion	CFD code (e.g. FEM3C, FLUENT, CFX, Fuego)
Fire	CFD code (e.g. FLACS, CFX, FDS, Phoenics, Kameleon, Vulcan, and Fuego)

7.2 Safety Analysis Guidance and Recommendations

The positive safety record of LNG vessels and the LNG transportation industry over the past 30 years is indicative of the extensive attention to safety being conducted through the cooperation of LNG importers, LNG transporters, the U.S. Coast Guard, emergency management and response teams, and by the risk and safety management considerations employed to improve LNG shipping and handling operations. Such considerations include:

- Double-hulled ship designs,
- Appropriate safety systems to reduce the potential for damage,
- Security management and escort of LNG ships operating in harbors and waterways, and
- Vessel movement and control zones (e.g., safety and security zones) to reduce the potential for impacts with other ships or structures.

These efforts have all significantly prevented or mitigated the potential for an accidental LNG cargo tank breach. While existing safety measures have been very effective, intentional attempts to breach an LNG cargo tank are now being considered as potential spill scenarios. Many recent studies have begun to consider both types of events and assess the safety and hazard issues of a subsequent fire or explosion of the spilled LNG. To date, most of these studies usually concentrate on postulating a spill scenario and calculating potential hazards and consequences without considering the likelihood of such an event. In addition, they often do not include experimental validation of the assumptions or analyses for the conditions

postulated, nor do they consider prevention or mitigation strategies that could reduce the impact or hazards of the postulated events.

The following three conclusions provide a summary of the major results of an LNG cargo tank breach, spill, and dispersion, and the results of a hazard evaluation analysis developed from what we think are credible accidental and intentional spill scenarios.

1. The most significant impacts to public safety and property exist within approximately 500 m of a spill, with lower impacts at distances beyond 1600 m, even for very large spills.
2. Under certain conditions, it is possible that multiple LNG cargo tanks could be breached, either as a result of an initial event, or as a consequence of cryogenic or fire-induced structural damage.
3. Based on this possibility, multiple breach and cascading LNG cargo tank damage scenarios were analyzed. While possible under certain conditions, they are likely to involve no more than two to three cargo tanks at any one time. These conditions will not greatly change the hazard ranges noted in General Conclusion Number 1 above, but will increase expected fire duration.

7.2.1 Accidental Breach Scenario Conclusions

1. Accidental LNG cargo tank damage scenarios exist that could potentially cause an effective breach area of 0.5 to 1.5 m^2.
2. Due to existing design and equipment requirements for LNG carriers, and the implementation of navigational safety measures such as traffic management schemes and safety zones, the risk from accidents is generally low.
3. The most significant impacts to public safety and property from an accidental spill exist within approximately 250 m of a spill, with lower impacts at distances beyond approximately 750 m from a spill.

7.2.2 Intentional Breach Scenario Conclusions

1. Several credible, intentional LNG cargo tank damage scenarios were identified that could initiate a breach of 2 m^2 –12 m^2 with a probable nominal size of 5 – 7 m^2.
2. Most of the intentional damage scenarios identified produce an ignition source such that an LNG fire is likely to occur immediately.
3. Some intentional damage scenarios could result in vapor cloud dispersion, with delayed ignition and a fire.
4. Several intentional damage scenarios could affect the structural integrity of the vessel or other LNG cargo tanks due to ignition of LNG vapor trapped within the vessel. While possible under certain conditions, these scenarios are likely to involve no more than two to three cargo tanks at any one time, as discussed in Sections 4 and 5.
5. Rapid phase transitions are possible for large spills. Effects will be localized near the spill source and are not expected to cause extensive structural damage.

6. The potential damage from spills to critical infrastructure elements such as bridges, tunnels, industrial/commercial centers, LNG unloading terminals and platforms, harbors, or populated areas, can be significant in high hazard zones.
7. In general, the most significant impacts from an intentional spill on public safety and property exist within approximately 500 m of a spill, with lower impacts at distances beyond approximately 1600 m from a spill, even for very large spills.

7.3 Risk Management Guidance for LNG Spills over Water

Based on this study, guidance is provided to support performance-based LNG spill prevention, spill management, and hazard evaluations for marine LNG import facilities. The consideration of operations, safety precautions, prevention strategies, and consequence modeling and evaluation approaches should be focused on reducing the risks of a potential LNG spill as identified and developed with public safety organizations, public officials, and appropriate stakeholders for a specific site and conditions..

The following guidance is provided to assist risk management professionals, emergency management and public safety officials, and other port security stakeholders in developing and implementing appropriate risk management strategies and processes.

7.3.1 General Risk Management Guidance

For both accidental and intentional spills, we recommend the following:

- The use of effective security and risk management operations that include enhanced interdiction, detection, delay procedures, risk management procedures, and coordinated emergency response measures, can reduce the risks from an accidental or intentional breaching event;
- Implemented risk management strategies should be based on site-specific conditions and the expected impact of a spill on public safety and property. Less intensive strategies would often be sufficient in areas where the impacts of a spill could be low.
- Where analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain or structures can occur, modern, validated computational fluid dynamics models can be used to improve analysis of site-specific hazards.

7.3.2 Guidance on Risk Management for Accidental Spills

Zone 1

These are areas in which LNG shipments transit narrow harbors or channels, pass under major bridges or over major tunnels, or come within approximately 250 meters of people and major infrastructure elements, such as military facilities, population and commercial centers, or national icons. Within this zone, the risk and consequences of an accidental LNG spill could be significant and have severe negative impacts. Thermal radiation could pose a severe public safety and property hazard and can damage or significantly disrupt critical infrastructure located in this area.

Risk management strategies for LNG operations should address both vapor dispersion and fire hazards. Therefore, the most rigorous deterrent measures, such as vessel safety or

security zones, waterway traffic management schemes, and establishing positive control over the vessel are options to be considered as elements of the risk management process. Coordination among all port security stakeholders is essential. Incident management and emergency response measures should be carefully evaluated to ensure adequate resources (i.e., firefighting, salvage, etc.) are available for consequence and risk mitigation.

Zone 2

These are areas in which LNG shipments and deliveries occur in broader channels or large outer harbors, or within approximately 250 m – 750 m of major critical infrastructure elements like population or commercial centers. Thermal radiation transitions to less severe hazard levels to public safety and property.

Within Zone 2, the consequences of an accidental LNG spill are reduced and risk reduction and mitigation approaches and strategies can be less extensive. In this zone, risk management strategies for LNG operations should focus on approaches dealing with both vapor dispersion and fire hazards. The strategies should include incident management and emergency response measures such as ensuring areas of refuge (enclosed areas, buildings) are available, development of community warning signals, and community education programs to ensure persons know what precautions to take.

Zone 3

This zone covers LNG shipments and deliveries that occur greater than approximately 750 m from major infrastructures, population/commercial centers, or in large bays or open water, where the risks and consequences to people and property of an accidental LNG spill over water are minimal. Thermal radiation poses lesser risks to public safety and property.

Within Zone 3, risk reduction and mitigation strategies can be significantly less complicated or extensive. Risk management strategies should concentrate on incident management and emergency response measures that are focused on dealing with vapor cloud dispersion. Measures should ensure areas of refuge are available, and community education programs should be implemented to ensure that persons know what to do in the unlikely event of a vapor cloud.

7.3.3 Guidance on Risk Management for Intentional LNG Spills

Zone 1

These are areas where LNG shipments occur in either narrow harbors or channels, pass under major bridges or over tunnels, or come within approximately 500 meters of major infrastructure elements, such as military facilities, population and commercial centers, or national icons. In these areas, the risk and consequences of a large LNG spill could be significant and have severe negative impacts. Thermal radiation can pose a severe public safety and property hazard and can damage or significantly disrupt critical infrastructure located in this area.

Risk management strategies for LNG operations should address vapor dispersion and fire hazards. The most rigorous deterrent measures, such as vessel safety or security zones, waterway traffic management schemes, and establishing positive control over the vessel are elements of the risk management process. Coordination among all port security stakeholders

is essential. Incident management and emergency response measures should be carefully evaluated to ensure adequate resources (i.e., firefighting, salvage, etc.) are available for consequence and risk mitigation.

Zone 2

These are areas in which LNG shipments and deliveries occur in broader channels or large outer harbors, within approximately 500 m – 1.6 km of major critical infrastructure elements, such as population or commercial centers. Within Zone 2, the consequences of even a large LNG spill are reduced. Thermal radiation transitions to less severe hazard levels to public safety and property.

Risk management strategies for LNG operations that occur in this zone should focus on fire and vapor dispersion hazards. The strategies should include incident management and emergency response measures such as ensuring areas of refuge (enclosed areas, buildings) are available, development of community warning signals, and community education programs to ensure persons know what precautions to take.

Zone 3

This zone covers LNG shipments and deliveries that occur greater than approximately 1.6 km from major infrastructures, population/commercial centers, or in large bays or open water, where the risks and consequences to people and property of a large LNG spill over water are minimal. Thermal radiation poses lesser risks to public safety and property. Within Zone 3, risk reduction and mitigation strategies can be less complicated or extensive than Zones 1 and 2. Risk management strategies should focus on incident management and emergency response measures for dealing with vapor cloud dispersion. Measures should ensure that areas of refuge are available, and community education programs should be implemented to ensure that persons know what to do in the unlikely event of a vapor cloud.

7.4 Key Conclusions: Safety Analysis and Risk Management

This study provides guidance on performance-based risk management approaches for analyzing and managing the threats, hazards, consequences, and risks to public safety and property due to an LNG spill over water. Based on the results of this study, we provide the following key conclusions:

1. The system-level, risk-based guidance developed in this report, though general in nature (non site-specific), can be applied as a baseline process for evaluating LNG operations where there is the potential for LNG spills over water.
2. A review of four recent LNG studies showed a broad range of results, due to variations in models, approaches, and assumptions. The four studies are not consistent and focus only on consequences rather than both risks and consequences. While consequence studies are important, they should be used to support comprehensive, risk-based management and planning approaches for identifying, preventing, and mitigating hazards to public safety and property from potential LNG spills.
3. Risks from accidental LNG spills, such as from collisions and groundings, are small and manageable with current safety policies and practices.

4. Risks from intentional events, such as terrorist acts, can be significantly reduced with appropriate security, planning, prevention, and mitigation.
5. This report includes a general analysis for a range of intentional attacks. The consequences from an intentional breach can be more severe than those from accidental breaches. Multiple techniques exist to enhance LNG spill safety and security management and to reduce the potential of a large LNG spill due to intentional threats. If effectively implemented, these techniques could significantly reduce the potential for an intentional LNG spill.
6. Management approaches to reduce risks to public safety and property from LNG spills include operation and safety management, improved modeling and analysis, improvements in ship and security system inspections, establishment and maintenance of safety zones , and advances in future LNG off-loading technologies. If effectively implemented, these elements could reduce significantly the potential risks from an LNG spill.
7. Risk identification and risk management processes should be conducted in cooperation with appropriate stakeholders, including public safety officials and elected public officials. Considerations should include site-specific conditions, available intelligence, threat assessments, safety and security operations, and available resources.
8. While there are limitations in existing data and current modeling capabilities for analyzing LNG spills over water, existing tools, if applied as identified in the guidance sections of this report, can be used to identify and mitigate hazards to protect both public safety and property. Factors that should be considered in applying appropriate models to a specific problem include: model documentation and support, assumptions and limitations, comparison with data, change control and upgrade information, user support, appropriate modeling of the physics of a spill, modeling of the influence of environmental conditions, spill and fire dynamics, and peer review of models used for various applications. As more LNG spill testing data are obtained and modeling capabilities are improved, those advancements can be incorporated into future risk analyses.
9. Where analysis reveals that potential impacts on public safety and property could be high and where interactions with terrain or structures can occur, modern, validated computational fluid dynamics (CFD) models can be used to improve analysis of site-specific hazards, consequences, and risks.
10. LNG cargo tank hole sizes for most credible threats range from two to twelve square meters; expected sizes for intentional threats are nominally five square meters.
11. The most significant impacts to public safety and property exist within approximately 500 m of a spill, due to thermal hazards from fires, with lower public health and safety impacts at distances beyond approximately 1600 m.
12. Large, unignited LNG vapor releases are unlikely. If they do not ignite, vapor clouds could spread over distances greater than 1600 m from a spill. For nominal accidental spills, the resulting hazard ranges could extend up to 1700 m. For a nominal intentional spill, the hazard range could extend to 2500 m. The actual hazard distances will depend on breach and spill size, site-specific conditions, and environmental conditions.

13. Cascading damage (multiple cargo tank failures) due to brittle fracture from exposure to cryogenic liquid or fire-induced damage to foam insulation was considered. Such releases were evaluated and, while possible under certain conditions, are not likely to involve more than two or three cargo tanks for any single incident. Cascading events were analyzed and are not expected to greatly increase (not more than 20%-30%) the overall fire size or hazard ranges noted in Conclusion 11 above, but will increase the expected fire duration.

APPENDIX A
RECENT LNG SPILL MODELING REVIEW

1 INTRODUCTION

This appendix reviews four recent reports developed over the past two years that assess the impacts of large LNG spills over water. A summary of the assumptions, models, and results of the analyses in each of the studies is presented first. Next, the differences in the studies are highlighted relative to the influence and impact the various assumptions and models have on the outcome and results. The review identifies potential concerns and uncertainties with each study and provides recommendations for the development of interim analysis techniques and processes to better and more consistently assess the consequences and hazards of LNG spills.

Four studies were evaluated to assess whether they provided a definitive determination of the lateral extent and thermal hazards of a large-scale release of LNG from a tanker over water. The studies evaluated were:

- Lehr, W. and Simecek-Beatty, D. "Comparison of Hypothetical LNG and Fuel Oil Fires on Water." Report by the National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, Seattle, WA, 2003, DRAFT [Lehr and Simicek-Beatty 2003].
- Fay, J.A. "Model of spills and fires from LNG and oil tankers." Journal of Hazardous Materials, B96-2003, 171-188, 2003 [Fay 2003].
- "Modeling LNG Spills in Boston Harbor." Copyright© 2003 Quest Consultants, Inc., 908 26th Ave N.W., Norman, OK 73609; Letter from Quest Consultants to DOE (October 2, 2001); Letter from Quest Consultants to DOE (October 3, 2001); and Letter from Quest Consultants to DOE (November 17, 2003) [Quest 2003].
- "Liquefied Natural Gas in Vallejo: Health and Safety Issues." LNG Health and Safety Committee of the Disaster Council of the City of Vallejo, CA, January 2003 [Vallejo 2003] [Koopman 2004].

Following is a summary of the major assumptions, models, and results concerning the potential hazards from an LNG spill from each of the four reports reviewed.

2 ASSUMPTIONS, MODELS, AND RESULTS FOR EACH STUDY

2.1 Lehr Study

The report provided by *Lehr* contrasts accidental spills from ships carrying refined petroleum products versus LNG [Lehr and Simicek-Beatty 2003]. Quantitative estimates are made of spread rate, maximum pool area, burn rate, burn duration, and effective thermal radiation. The following provides a summary of the assumptions, models, and results from this report, for LNG spills only.

2.1.1 Breach Scenario Assumptions

No assumptions were made regarding how a spill might occur.

2.1.2 Spreading Model

The spread rate model does not take into account the mass loss due to evaporation while the pool is spreading if ignition does not occur immediately. The pool radius is a function of spill rate for continuous spills or volume spilled for an instantaneous spill.

If ignition occurs immediately and the spill is instantaneous, an approximate relation is used, which is a function of minimum pool thickness, burn regression rate, and source leak rate.

The pool is spreading on a quiescent surface. Waves are not considered.

Viscosity and surface tension of the LNG are neglected.

The model assumes that the LNG will spread in a uniform circle.

2.1.3 Dispersion Model

Dispersion is not considered.

2.1.4 Flame model

The flame is modeled as a circular cylinder that radiates upward and uniformly over the cylinder's surface. Flame tilt due to wind is not considered. Flame height is approximate according to the empirical correlation by Thomas [Thomas 1965].

Incident thermal radiation to an object is determined by calculating the product of the average emissive power at the flame surface, an atmospheric transmission factor, and a geometric view factor. An average emissive power is calculated by an empirical correlation taken from the Society of Fire Protection Engineers Handbook.

The transmission factor is calculated by a relation from Glasstone and Dolan, who base their work on thermal radiation from a nuclear bomb explosion [Glastone and Dolan 1977].

Burn regression rate is according to values give from experiments performed by Raj [Raj et al. 1979]. The rates were found to vary from 0.4 to 1 mm/s.

2.1.5 Results

The results are given for one example, an instantaneous LNG spill of 500 m^3. The pool is burning while it is spreading.

A maximum spread velocity of 1 m/s results after a few seconds.

The maximum burn time is approximately two – three minutes.

At maximum radius and flame height, the radiation fraction of the heat of combustion is 0.21.

At a distance of 500 m from the pool's edge, a maximum average radiant heat flux of 7 kW/m^2 is obtained.

The pool radius calculated was not stated.

2.2 Fay Study

Fay provided an analysis of the spreading of LNG, duration of a pool fire burn, and heat release. These quantities are expressed in terms of the cargo tank geometric properties [Fay 2003]. The following provides a summary of the assumptions, models, and results from this analysis.

2.2.1 Breach Scenario Assumptions

No assumptions were made regarding how a spill might occur.

2.2.2 Spreading Model

The spreading model includes the vaporization of the pool as the pool spreads.

The pool is assumed to spread in the shape of a uniform semi-circle.

The pool is spreading on a quiescent surface. Waves are not considered.

Viscosity and surface tension of the LNG are neglected.

Breaches above and below the water's surface are considered.

A value of (5 –7) x 10^{-4} m/s is used for the vaporization rate of LNG on water.

2.2.3 Dispersion Model

Dispersion is not considered.

2.2.4 Flame model

The flame is not modeled.

Radiant flux to an object is approximated by taking a fraction of the heat release rate, averaged over the fire's duration, and dividing by the square of the distance to an object. The radiation flux heat release rate fraction is assumed as 0.15.

2.2.5 Results

The example given assumes 14,300 m^3 of LNG from a single tank spills onto the water. The values for maximum pool area are given as a function of puncture area. A total vaporization rate of 8×10^{-4} m/s is used to account for heating from the water below and fire above the LNG.

For the equivalent puncture area given in the *Quest* report of 19.63 m^2 (5 m dia. hole), the maximum pool radius calculated by *Fay* is 252 m, assuming the shape is a circle. For a semicircle, the radius is 357 m.

The burn duration for this rupture area and pool area is reported as 3.3 minutes.

The distance from the fire to an object at which the radiant flux is 5 kW/m^2 is 1.9 km.

2.3 Quest Study

Quest conducted an analysis of the consequence of a potential release of LNG from an LNG tanker at Boston Harbor [Quest 2003]. They considered how a potential release could occur and provided an analysis of the spreading of LNG, as well as the flammable hazards after the release. The following provides a summary of the major assumptions and models that *Quest* used, and its analytical conclusions.

2.3.1 Breach Scenario Assumptions

The scenario considered is a ship-to-ship collision in the outer harbor of Boston. It is assumed that the tanker has five LNG membrane tanks holding 25,000 m^3 each, to allow for a total holding capacity of 125,000 m^3. The ships separate after the collision.

A hole results from the collision just above the waterline in one of the five tanks only. The largest hole size that results is five meters.

LNG at a pressure of 1.45 psig and temperature of –160.5 C leaks from the hole. The LNG is composed of 96.97% methane, 2.62% ethane, 0.316% propane, and trace amounts of other compounds.

No explosions occur.

2.3.2 Spreading Model

The LNG will spill onto the water and spread. A simple orifice model is used to determine that it will take two minutes for the ruptured tank to empty to the waterline, spilling 12,500 m^3 of LNG.

The model assumes that the LNG will spread in a uniform circle.

The spread rate is a function of spill rate, vaporization rate, and pool radius.

A value of 0.18 kg/m^2 is used for the vaporization flux of LNG on water.

Viscosity and surface tension of the LNG are neglected.

Waves will affect the spreading. This feature is accounted for by assuming that the waves are a simple cycloid shape. The wave effect on spreading is incorporated through a conditional statement at the boundary of the pool; namely, the pool will stop spreading once the LNG drops below 60% of the wave height. The effect of waves also increases the vaporization flux by 27% due to the increase in surface area.

Three averaged wave heights, taken from NOAA Boston Harbor buoy data, are considered: 0.575 m, 0.682 m, and 1.24 m.

2.3.3 Dispersion Model

A vapor cloud will form and disperse. This was modeled by using Quest's software dispersion code 'CANARY,' which accounts for transient release rates, initial velocity of the released gas, initial dilution of the vapor, thermodynamics, gas cloud density relative to air, and mixture behavior. Another code, DEGADIS, was also used for comparison.

Three different wind speeds were considered: 1.5 m/s (F stability class), 5.0 m/s (D stability class), and 9.0 m/s (D stability class). Stability class refers to atmospheric stability. F class is extremely stable and results in the greatest amount of time for the released gases to mix with the atmosphere. D class is neutrally stable; thus mixing will occur faster in class D than in F class.

2.3.4 Flame model

The fuel is assumed to ignite because of the collision.

The flame is modeled as an elliptical cylinder; thus, a tilted flame. The base of the flame is assumed to increase due to flame drag and is approximated by an empirical correlation [Moorehouse 1982]. Flame angle is calculated by using an empirical formula by Welker and Sliepcevich [Welker and Sliepcevich 1970]. Flame length is approximated by an empirical correlation [Dorofeev et al. 1991]. The flame is divided into two zones: a clear zone with no smoke, and a zone in which a fraction of the flame is obscured by smoke. The length of the clear zone is determined by an empirical correlation [Pritchard and Binding 1992].

2.3.5 Results

Quest concluded the following values from its analyses:

Table 24: Model Results (Quest Study)

WIND SPEED (m/s)	WAVE HEIGHT (m)	MAXIMUM LNG RADIUS	TOTAL TIME TO BURN SPILL (min)	DISTANCE TO:		
				22.1 kW/m²	12.6 kW/m²	4.73 kW/m²
1.5	0.575	78 m (257 ft)	14.3	226 m (740 ft)	309 m (1,015 ft)	497 m (1,630 ft)
5.0	0.672	73 m (239 ft)	16.6	270 m (885 ft)	351 m (1,150 ft)	531 m (1,740 ft)
9.0	1.24	55 m (180 ft)	28.6	281 m (920 ft)	349 m (1,145 ft)	493 m (1,615 ft)

At these radiant flux levels, the following occur:

Table 25: Impact of Radiation (Quest Study)

22.1 kW/M²	Structural steel weakens after prolonged exposure to this flux level.
12.6 kW/M²	Vapors evolving off of a wooden structure might ignite after several minutes of exposure to this flux level if ignition source is present
4.73 kW/m²	Second-degree skin burns are possible after 30-seconds exposure to this flux level.

For the dispersion calculations of the vapor cloud:

Table 26: Dispersion Calculations (Quest Study)

WIND SPEED (m/s)	STABILITY CLASS	MAXIMUM LNG RADIUS	DISTANCE TO LOWER FLAMMABILITY LIMIT	
			Canary	Degadis
1.5	F	80 m (261 ft)	4,030 m (13,220 ft)	3,400 m (11,155 ft)
5.0	D	73 m (239 ft)	1,050 m (3,445 ft)	1,900 m (6,230 ft)
9.0	D	55 m (180 ft)	340 m (1,115 ft)	1,100 m (3,610 ft)

2.4 Vallejo Study

This study is specific to a particular locale, which includes land and marine facilities for a potential LNG import facility [Vallejo 2003]. The *Vallejo* authors discuss a wide range of initiating events, from accidents to natural events to malevolent acts, and assess the qualitative likelihood of each; but no spill analysis is tailored to different initiating events. The report also includes ideas for mitigation options to enhance safety. Ronald P. Koopman retired from Lawrence Livermore National Laboratory provided the dispersion and thermal hazard results. The report also provides the analysis and results performed by *Quest*. The following pertains only to the work performed by R. P. Koopman. [Koopman 2004]

2.4.1 Breach Scenario Assumptions

The report discusses a variety of ways that a breach to an LNG cargo tank can occur, such as terrorism, operational errors, and maritime accidents. It was not stated how a rupture occurs for the example calculations given.

2.4.2 Spreading Model

Both one-meter and five-meter diameter holes in one 25,000 m^3 LNG ship tank were analyzed. The National Ocean Atmospheric Administration's code, ALOHA (Aerial Locations of Hazardous Atmospheres), was used to calculate the spill from the ship tank. In 6 min., 14,300 m^3 were spilled from the five-meter diameter hole and in 35 min from the one-meter diameter hole. The five-meter diameter hole resulted in a pool with a maximum area of 110,000-130,000 m^2. Vaporization rates of $5x10^{-4}$ m/s were used for evaporation from the water alone, and $8x10^{-4}$ m/s when fire was present.

2.4.3 Dispersion Model

The Lawrence Livermore National Laboratory's SLAB atmospheric dispersion model for denser than air releases were used for the dispersion calculations. Dispersion calculations were performed for two different wind speeds and stability class conditions: 2 m/s (F stability class) and 5 m/s (D stability class). Calculations were performed for two different hole sizes, 1 and 5 meters in diameter.

2.4.4 Flame Model

A pool fire was considered the result due to ignition of 14,300 m^3 of LNG from a tanker. Distances cited were based on a point source model. Attenuation due to atmospheric water vapor was not included. A fireball calculation was also performed, but for a land-based storage tank. Vapor cloud fires were also discussed; but no calculations were performed.

2.4.5 Results:

Pool fire heat radiation results:

Table 27: Fire Heat Radiation Results (Vallejo Study)

HOLE SIZE (m)	DISTANCE TO RADIANCE FLUX LEVEL OF:		
	30 kW/m^2	17 kW/m^2	5 kW/m^2
5 (16.4 ft)	0.35 miles (563 m)	.5 miles (804 m)	0.8 miles (1287 m)

Dispersion calculations of the vapor cloud results:

Table 28: Vapor Cloud Dispersion Calculations (Vallejo Study)

HOLE SIZE DIAMETER (m)	WIND SPEED (M/S)	PASQUILL-GIFFORD ATMOSPHERIC STABILITY	DISTANCE TO LOWER FLAMMABILITY LIMIT miles (meters)*
5	2	F	2.8 miles (4506 m)
5	5	D	1.5 miles (2414 m)
1	5	D	0.7 miles (1126 m)

*Does not consider the limiting effect of topography

3 SUMMARY OF LNG SPILL ASSUMPTIONS AND RESULTS FROM EACH STUDY

Tables 29 and 30 and Figure 6 summarize both the assumptions and the results of each of the reports reviewed.

Table 29: Summary of Study Assumptions

STUDY	TIME TO EMPTY (min)	VAPORIZES DURING SPREAD	WAVE EFFECTS INCLUDED	SHAPE OF POOL	IGNITION TIME	FLAME MODEL	COMBUSTION MODE	IGNITION OCCURS AT POOL, NOT IN VAPOR CLOUD
Lehr	Instantly	Yes	No	Circle	Instantly upon release	Solid cylinder	Diffusion flame; No explosion	Yes
Fay	Varies with hole size	Yes	No	Semi-circle	Instantly upon release	Point source	Diffusion flame; No explosion	Yes
Quest	2	Yes	Yes	Circle	Instantly after spread	Solid cylinder; including tilt for wind effects	Diffusion flame; No explosion	Yes
Vallejo	Varies with hole size	Yes	No	Circle	Instantly upon release	Point Source	Diffusion flame; No explosion	Yes

Table 30: Summary of Study Results

STUDY	FUEL SPILL VOLUME (m^3)	AREA OF FUEL SPILL (m^2)	"SKIN BURN" DISTANCE[a] (m)	"PAPER IGNITION" DISTANCE[b] (m)	FIRE DURATION (min)
Lehr	500 (hole area not specified)	Not reported	500[c]	Not reported	2-3
Fay[e]	14,300 ($20m^2$ hole area)	200,000	1900	930	3.3
Quest	12,500 ($20m^2$ hole area)	9503	490 [d]	281[d]	28.6
Vallejo	14,300 ($20m^2$ hole area)	120,000	1290	660	9.0

[a]A thirty-second exposure to heat levels of 5 kW/m^2 causes second-degree skin burns(blisters) at this distance.
[b]A seventeen-second exposure to heat levels of 22 kW/m^2 causes newspaper to ignite at this distance. (Ref.: SFPE Handbook of Fire Protection Engineering, 2nd ed., National Fire Protection Association, (1995).
[c] Distance from edge of spill
[d]Assuming a wind speed of 9 m/s (20 mph).
[e] Considers a range of hole sizes. This size chosen for comparison.

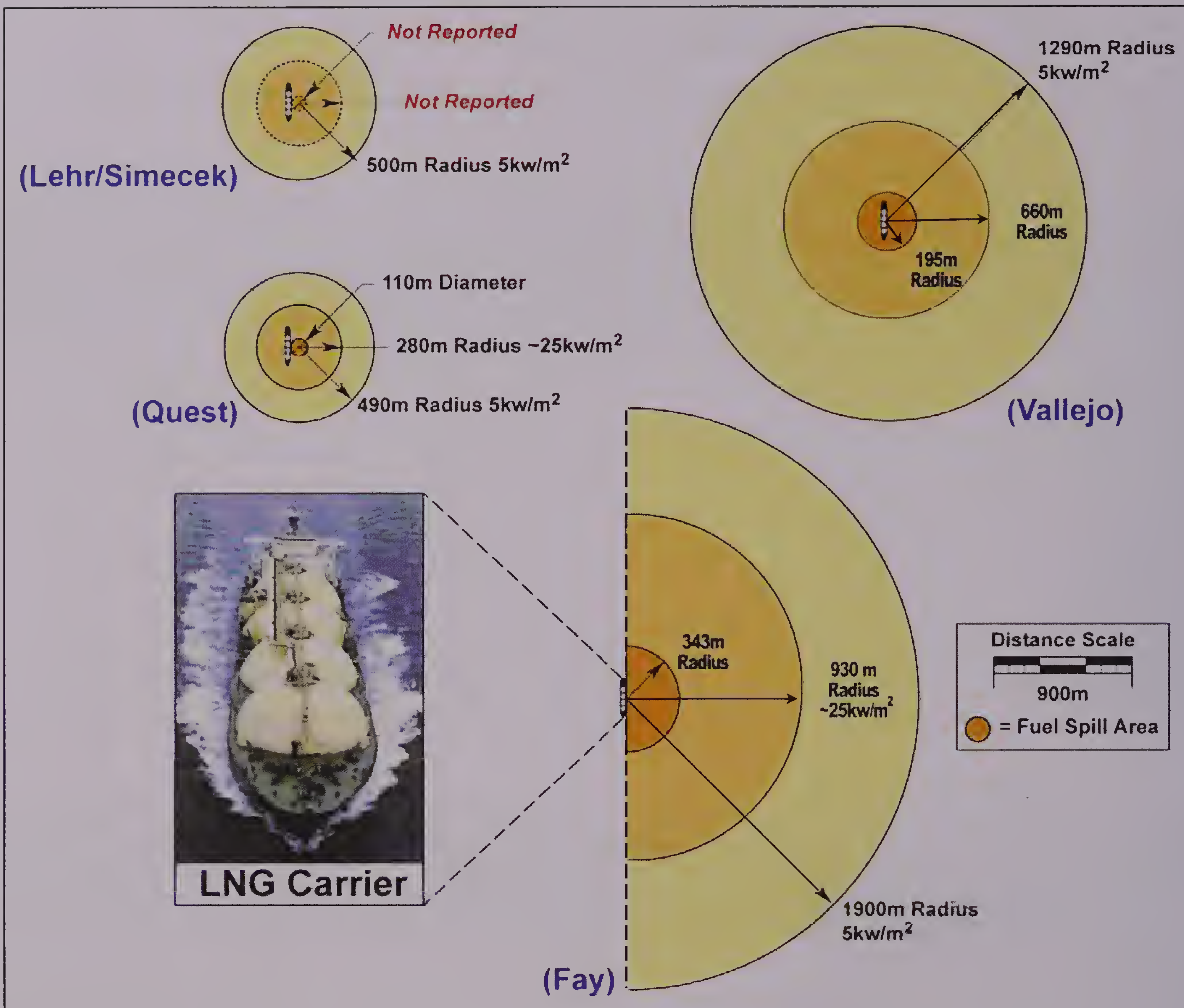


Figure 6. Graphical Summary of the Results of the *Lehr, Fay, Quest & Vallejo* Studies
(Yellow = 5kW/m^2; lt. Orange = 25 kW/m^2; dk. Orange = fuel spill radius)

4 WHY THE STUDIES DIFFER

The following discussion provides comparisons among the different reports and explains why different results are obtained. It is not intended to be an assessment of the merit or validity of the reports.

It is difficult to provide a direct comparison of the results among the reports because each provides a different scenario and/or example assumptions. The example case given by *Lehr* is especially difficult to compare to the other three reports because of the much lower amount of LNG spilled. Pool diameter, radiant flux, and burn duration will depend upon the scenario or example assumptions used, as evident from the reports. Obviously, a larger pool fire would result if all of the five cargo tanks were ruptured due to a larger amount of fuel spilled.

Direct comparison is also difficult due to the lack of information in these reports. The *Lehr* and *Vallejo* reports do not state the pool area values they calculated. *Quest* does not provide surface emission powers used in their heat transfer calculations. The *Vallejo* report does not provide information on the flame model that was used.

In *Quest*, the time of ignition of the pool is unclear in the analysis. *Quest* states that a higher effective vaporization rate results due to back-radiation from the pool flame. When this is included in their model, it reduces the time to vaporize the pool, but not the pool radius. Apparently, the pool is allowed to fully spread with the effect of waves included before ignition results. This contradicts the statement made that ignition occurs because of the collision, which would indicate immediate ignition.

In order to obtain some idea of the effect of including vaporization from back-radiation on pool radius, consider a steady-state situation in which the flow rate into the pool is balanced by both the flow rate provided through vaporization from heating from below by the water and by heating from above by the flame. If an average flow rate of 40,056 kg/s (obtained from *Quest*) and a vaporization rate of 8×10^{-4} m/s (.346 kg/m^2 s) are used, a pool radius of 192 m results. Thus, reducing the radius below that of *Quest*'s value of 253 m before the effect of waves is included. This is an approximation because, in reality, the flow rate decreases with time; whereas this example assumes an infinite source to provide a steady flow rate.

Of the reports, it is possible to somewhat compare the results given for pool area by *Quest* and *Fay*, because the amount spilled is similar; 12,500 versus 14,300 m^3 of LNG, and both can be compared for equivalent hole sizes. The value given for pool radius by *Quest*, before including the effect of waves, is 253 meters. *Fay* reports a value of 252 m, if the radius is calculated based upon the shape of a circle. Thus, the two reports compare favorably for pool area when waves are not considered. *Quest* found that, by including the effect of waves, the pool radius decreased to 55 m for the high wind case. This is why *Quest* reports a significantly different value for pool radius. *Fay* considered a perfectly smooth surface upon which the fuel spreads, while *Quest* considered the impeding action of waves.

The value reported by *Quest* and *Fay* for the distance required for an object to receive a radiant flux of approximately 5 kW/m^2 is significantly different: 493 m versus 1900 m,

respectively. One obvious reason for this difference is that *Fay's* analysis predicts a much larger pool fire. For instance, by using the relation that *Fay* used to determine the radiant flux at the distance and pool area given by *Quest*, the distance is 353 m at which the radiant flux is 5 kW/m^2. Thus, pool area will make a significant difference.

Fay also did not model the flame in his analysis. The relation he used provides a crude approximation to the thermal radiation emitted by a pool fire. The radiant flux emitted by a pool fire to an object is dependent upon many factors, such as pool size, fuel type, flame shape, and view factors.

The reports by *Lehr* and *Fay* use reasonable values for the burn rate of LNG. *Quest* does not explicitly provide the value that they used, though it can be inferred that they used a value of approximately 2.1 x 10^{-4} m/s (.09 kg/m^2 s). The range of burning rate values, determined experimentally by other researchers, has been found to be: 3.2 x 10^{-4} m/s (35 m dia.) [Johnson 1992], 2.5 x 10^{-4} m/s (18 m dia.) [Drake and Wesson 1976] and 2.1 – 4.2 x 0^{-4} m/s (30 m dia.) [Mizner and Eyre 1983].

The burn duration of 28.6 minutes given by *Quest* is reasonable, given the pool radius and the amount spilled. It is difficult to check this accurately, because the amount of fuel left after vaporization during spreading is unknown. A burn time of 31.6 minutes results, assuming a mass flux value of 0.3 kg/m^2 s (from heating from water below and heating above), pool radius of 55 m, and 12,500 m^3 of LNG. A longer burn time for this example occurs because it is assumed that all of the LNG spilled is available for burning. For a pool radius of 252 m, a burn time of 1.7 minutes results if 14,300 m^3 is assumed available, and a mass flux of 0.3 kg/m^2 s is assumed. This assumes a pool that is ignited after it spreads to 252 m. *Fay* reports a burn time of 3.3 minutes using a spill volume of 14,300 m^3, 252 m pool radius, and mass flux of 0.345 kg/m^2 s. His burn time differs because it pertains to a pool that is burning while it is spreading.

Thus, there is a trade-off between the size of the fire and burn duration. For fires of increasing size, the burn duration decreases. It is interesting to note that *Quest* reported it took two minutes for 12,500 m^3 of LNG to spill from a five meter diameter hole, and that *Fay*'s result for pool diameter for the same hole size results in a burn time of 3.3 minutes. *Fay*'s spill time would have been longer, because he was considering 14,300 m^3. Thus, the time taken to spill would have been approximately equivalent to the time taken to burn in *Fay*'s example.

Following is a table summary comparing the results of *Quest* and *Fay*:

Table 31: Summary of Results [Quest vs. Fay]

STUDY	HOLE SIZE (m)	VOLUME SPILLED (m^3)	POOL RADIUS; NO WAVES (m)	POOL RADIUS; WAVES (m)	DISTANCE TO 5 kW/m^2	BURN DURATION (min)
Quest	5	12,500	253	55	493 m**	28.6
Fay	5	14,300	252	Not considered	1900 m*	3.3

*Using *Fay*'s combustion model, this value would be 353 m, if the pool had a 55 m radius.
**Based upon 55 m radius pool

5 IDENTIFICATION OF GAPS AND LIMITATIONS IN THE STUDIES

In the context of a comprehensive risk analysis, one needs to overlay onto the event tree in Figure 4 the body of knowledge provided by the four studies. The missing pieces are the gaps identified. It is evident at the highest level that the four reports omit consideration of many aspects within the context of the event tree.

Additionally, the reports do not cover several potential types of consequences not involving LNG ignition (e.g., asphyxiation, cryogenic burns to humans, cryogenic damage to the ship's structure). Thus, several potential consequences of an LNG spill are not considered.

In addition, risk assessment modeling of mitigation of potential harm to people, facilities, or the LNG ships was not provided. Although the scope of this evaluation did not include remediation of the shortcomings within the four studies, it does pose those missing issues and subsequent analysis techniques that should be considered on a site-specific basis.

5.1 LNG Cargo Tank Breach Modeling

All of the studies assumed breach scenarios. Better definition of realistic breach scenarios and LNG tanker breach and spill calculations should be investigated for site-specific conditions evaluated. Specific intentional breach scenarios are not well known; but general scenarios such as hijackings, terrorist attacks, and insider-supported actions are events that have occurred in the past and should be commonly considered. Prevention and mitigation concepts should be considered to address these impacts, especially in high consequence, highly industrialized or highly populated areas.

5.2 LNG Liquid Transport Modeling

Quest's analysis indicates that the effect of waves is significant. Their model, however, is a very simplistic representation of a standing wave. The boundary condition they invoked to account for waves is one-dimensional and has only a bounding effect, rather than an effect that aids in spreading. Models that are more sophisticated should be considered, such that the physics of traveling waves are included. From the experiments by Mizner and Eyre, the pool formed was far from circular, and was more of a 'boom-a-rang' shape. This indicates that the dynamics of waves can indeed have a significant effect on pool spreading.

5.3 LNG Combustion Modeling

All of the reports use very simplified models, solid flame or point source, to determine the radiant heat flux from the flame. Far more sophisticated methods to model the flame are currently available. Due to increased computer capabilities, validated CFD codes exist for chemically reacting flows that have radiation and soot models. These codes also have the capability to model the effect of wind on the flame by invoking a wind boundary condition. Thus, flame tilt due to wind effects can be captured. It is recommended that these codes be used to model the flame, rather than the solid flame or point source models used in these studies.

All the reports assume that the fuel ignites immediately and that only a pool fire results.

As an example of a different combustion scenario, the experiments performed by Mizner and Eyre involved an ignition source 130 meters away from the spill source. A vapor cloud developed above the spill, propagated towards the ignition source and ignited. They observed that the flame propagated in two modes in the vapor cloud, as a pre-mixed flame in regions where air and fuel were mixed within the flammability limits, and as a diffusion flame in fuel-rich regions. The diffusion flame propagated back to the spill point, whereupon a pool fire resulted. Thus, pre-mixed and diffusion modes of burning can occur. The implication of this deals with the potential occurrence of explosion in pre-mixed regions, given potential breach conditions and ignition sources.

5.4 LNG Plume Modeling

The LNG plume (vapor cloud) calculations contained in the *Quest* and *Vallejo* studies are performed with standard, simplified plume models (SLAB, which is employed in CANARY and DEGADIS). These models are appropriate for dense gas dispersion such as would occur initially after an LNG spill, as discussed in the report and as supported by Lazaro et al [Lazaro et al. 1997]. The parameters used in the calculations (wind speed and stability class) are consistent with the weather data obtained. Note that these simplified plume models neglect important phenomena that might be significant.

The first phenomenon of concern is the plume itself. The plume changes characteristics during its evolution, so designation as a dense gas plume or a Gaussian plume (non-dense gas) changes with time. The initial release of the cold vapor qualifies the plume as a dense gas, because the density is significantly greater than the ambient air.

Second, the topography of the area is not considered. Due to the surrounding topography, the initially heavy gas plume will tend to be channeled along surrounding low areas, potentially decreasing the spread of the plume and increasing the plume concentration. Dependent upon the wind direction, the plume could either be directed towards populated regions or out over the water. If the predominant wind direction at a site is toward more populated regions and will initially be confined by surrounding terrain, more severe conditions might exist.

The third point is the influence of the ship and the surrounding structures on the plume behavior. Depending upon the wind direction and the location of the breach, the effect of the ship might significantly decrease the plume concentrations near the ship, due to increased mixing from turbulent eddies.

All of the phenomena of concern (topography, plume characteristics, influence of ship) can be addressed through the use of validated CFD codes such as FEM3A. FEM3A has been specifically developed to deal with LNG releases by the Gas Technology Institute and is specified in 49 CFR 193 as a model to include topographical or obstacle (ship) effects [Havens and Spicer 2002]. The use of FEM3A in predicting LNG vapor dispersion is illustrated by Chan [Chan 1992].

To assess LNG plume behavior at different times of the year for different wind conditions, it is recommended that CFD calculations using FEM3A (or its more recent version, FEM3C) or an equivalent be performed in the future using appropriate topography and hypothetical ship location scenarios. These simulations will allow for a much more mechanistic determination of the plume characteristics and the influence of the various phenomena discussed above.

5.5 LNG Spill Overpressure Considerations

The *Lehr, Fay, Quest, and Vallejo* studies did not address the possibility of overpressure and resultant damage, either from ignition on the ship or over open water. The LNG-Air explosion information discussed in Section 3 addresses these issues and concerns. Evaluation of the possibilities of events that could lead to this type of impact is discussed in Appendix D and should be considered on a site-specific basis.

6 RECOMMENDATIONS BASED ON REVIEW OF THE FOUR STUDIES

Each of the studies reviewed contains gaps and limitations in analyzing the risks and consequences of a major LNG spill over water. Several potential actions should be considered:

- Risks of potential large-scale, open-water LNG spills should be studied using modern risk analysis and risk assessment methods and techniques.
- More detailed and sophisticated LNG tanker modeling coupled with experimental validation should be undertaken, especially with respect to breach/ship interactions, ignition of escaping natural gas, LNG dispersion, and potential human and structural impacts and damage.
- These analyses should be supported by validation at the appropriate scale with the latest experimental data.
- Improvements in risk management and prevention and mitigation strategies and technologies should be evaluated to help identify the most cost effective approaches for reducing the probability, consequences, and risks to public safety and property of a large-scale LNG spill over water.

Following these efforts, guidelines for defining improved assumptions and improved approaches for simplified risk and consequence analyses could be developed, in collaboration with national and international experts, for adoption nationwide, similar to approaches already developed for locating land-based LNG storage facilities. This would help ensure that accurate and consistent approaches are used to calculate the site-specific hazards and reduce the risks of a potential large LNG spill over water.

APPENDIX B
THREAT ANALYSIS AND SPILL PROBABILITY

1 INTRODUCTION

High consequence operations such as the transportation of LNG imply potential risks to people, facilities, and equipment. Effectively evaluating the risks of a large LNG spill over water requires that the potential consequences be considered in conjunction with the probability of an LNG cargo tank breach and spill, along with the range of physical or operational measures that can be employed to prevent or reduce the hazards and risks of a potential spill. Appendix B discusses the modeling and analysis conducted of the probability and likelihood of an LNG cargo tank breach from a range of threats and the associated size of the breach.

2 ASSUMPTIONS, MODELS, AND THREAT ANALYSIS

The breach of an LNG carrier can include both accidental and intentional scenarios. While potential accidents are commonly considered in the development of safety equipment and systems, operational directives, and risk management and emergency response plans, intentional acts such as sabotage, intentional grounding, or even physical attacks in the past have often not been considered. However, under existing international situations, intentional attacks and the security and protection of critical infrastructures and systems must be considered.

For this study, a wide range of potential accidental and intentional breachings of LNG cargo tank scenarios were evaluated. Scenarios considered were based on discussions with intelligence agencies and a review of emerging hostile activities around the world [Krane 2000]. This historical information was used to develop credible threat scenarios. For these scenarios, modeling and analysis tools were used to establish a range of expected or likely breaches of an LNG cargo tank and the results presented in Table 36 below.

2.1 Accidental Breaching Evaluations

As noted in Section 2 of this report, the LNG industry has an exemplary safety record with only eight marine accidents over the past 40 years in which LNG was spilled, but without resultant fires. None of these accidents led to a loss of life. Even with this excellent safety record, consideration should be given to what might be a likely LNG cargo tank breach based on a potential accidental collision with another ship, grounding, or ramming. The severity of a breach based on these events depends on the location, vessel design, relative vessel speeds and collision alignment, and mitigation or prevention systems in place to limit potential damage.

Sandia had previously conducted sophisticated finite element modeling of collisions of a series of ships with a double-hulled oil tanker similar in overall size, mass, and design to an LNG vessel. A summary of the analysis of a 90-degree collision of a large container ship (50,000 metric ton class ship) and a double-hull tanker (80,000 metric ton class) is shown in Figure 7 and collisions with smaller ships are shown in Figure 8 [Ammerman 2002]. The

analysis tool included an approximately 250,000 finite element model of both the impacting vessel and the double-hulled tanker using PRONTO-3D run on a massively parallel computer with 256 processors. This is a transient dynamic, explicitly integrated, Lagrangian solver of the equations of motion. The analysis tracked the progressive failure of the struck ship as the striking ship penetrated. As noted in these figures, breaching of the inner hull does not occur until impact velocities exceed approximately 5 – 6 knots for large vessels. For small vessels, such as pleasure craft, kinetic energy is approximately one to two million N·m. Figure 8 shows that this level of kinetic energy is generally insufficient to penetrate the inner hull of a double-hulled vessel such as an LNG ship.

This analysis also calculated that penetration into a double-hulled tanker must be approximately three meters before a hole occurs in the inner hull. This, therefore, can be used to estimate the minimum size of a penetration to cause a penetration and spill in a grounding event. Because of the design of LNG ships, the penetration could be even greater in many cases. The results for this analysis were compared with initial collision information from the recent Baltic Carrier collision at approximately 12 knots. The results of these analyses over-predict, by about 15%, the external hole size measured for that collision

Based on these analyses, several observations can be made. First, LNG vessels, because of their additional insulation and third level of containment, would require deeper penetrations to rupture the primary LNG cargo tank. Therefore, because of its general design and construction, collision velocities for equivalent hole sizes could be expected to be 1-2 knots higher for an LNG vessel. This would suggest the required velocity to cause a breach of an LNG cargo tank during a 90 deg collision with a large vessel to be 6-7 knots. Collisions at shallower angles would need to be several knots higher in order to penetrate an LNG cargo tank. Referring to Figure 7, collisions with larger vessels than those considered in the analysis could cause slightly larger holes, which should be considered in developing accident prevention strategies

An additional element to consider in the accident scenario is that the hole size developed probably is not the size of the spill orifice. In many collisions between two ships, the ships can remain joined for several hours if significant penetration of one ship occurs. The analysis by Ammerman suggests that as little as 5 – 10% of the generated breach size would be available for the release of LNG. Therefore, the collision of a large ship with an LNG carrier at even 12knots is expected to produce an effective hole area of no more than approximately one square meter for an LNG spill. If larger spills do occur, hole sizes could approach those calculated for intentional breaches.

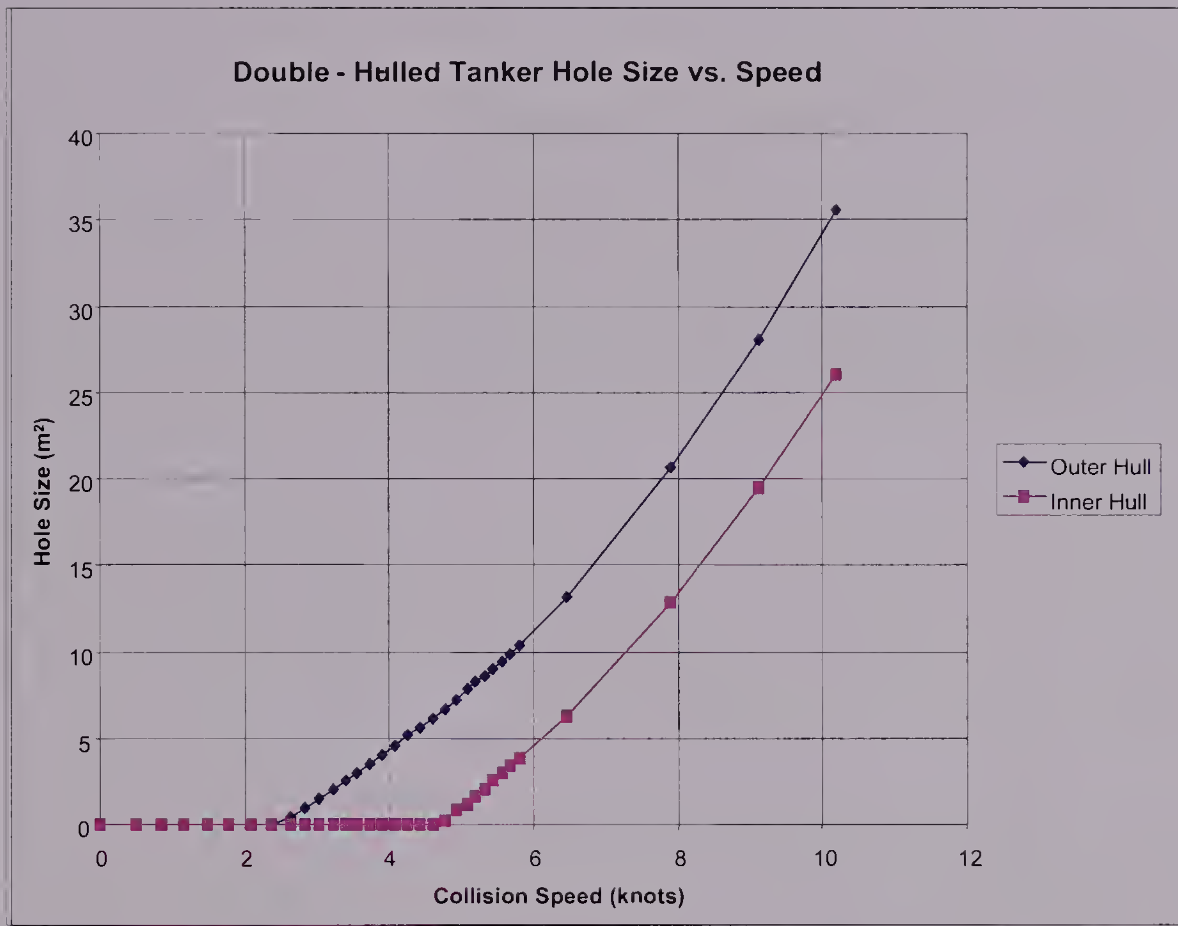


Figure 7. Study Estimate of Speed Required to Create a Given Hole Size

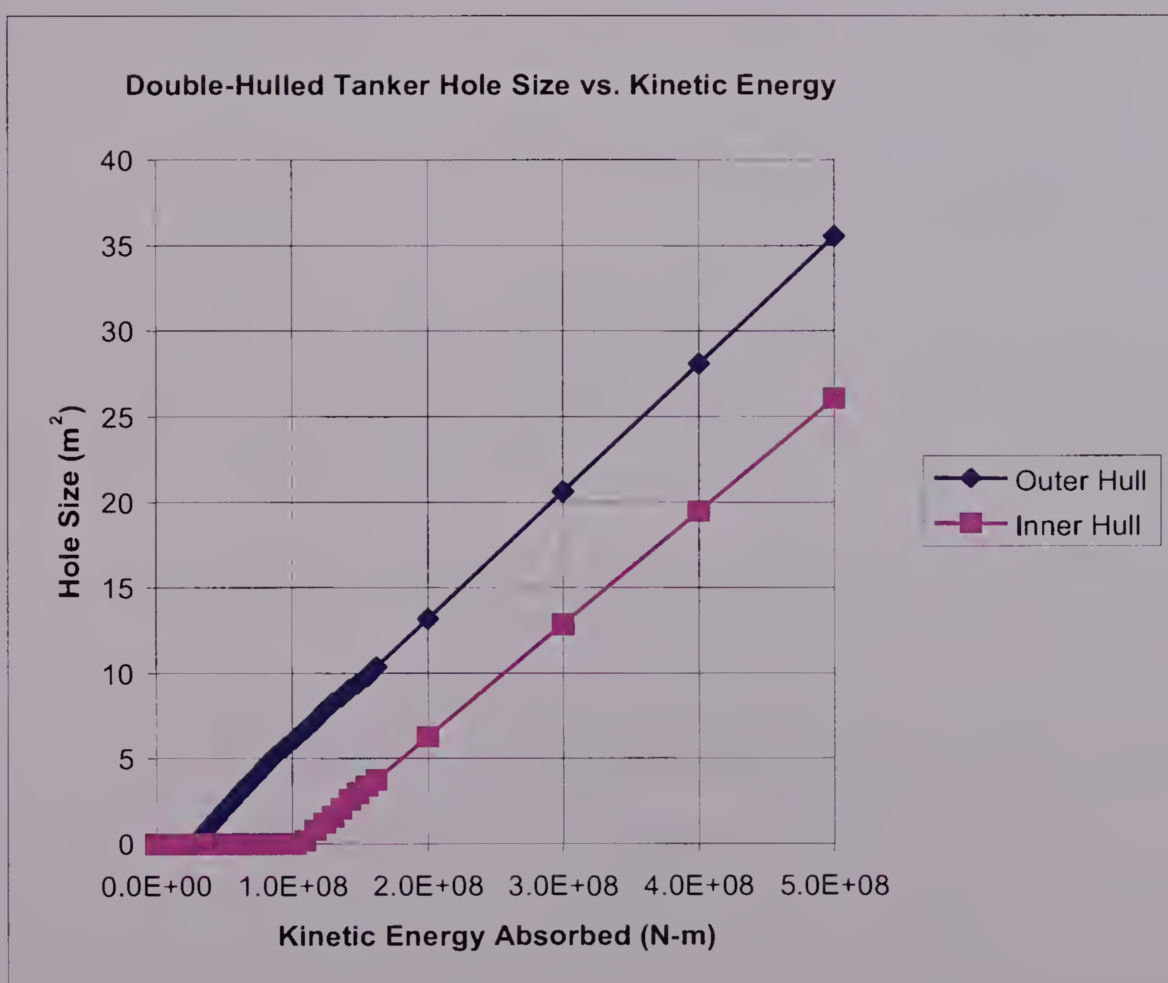


Figure 8. Double-Hull Tanker Study of Energy Required to Create a Given Hole Size

2.2 Intentional Breaching Evaluations

The breach of an LNG cargo tank from an intentional act should include evaluation of a range of threats, including sabotage, insider threats, and external attacks. A wide range of attacks against ships has been documented, including hijackings, attacks with small missiles and rockets, and attacks with bulk explosives [Krane 2000]. While this range of threats must be considered when assessing the vulnerability and consequences of an intentional attempt to breach an LNG vessel, the actual threats and consequences are sensitive.

While a discussion of the specific threats and expected consequences is inappropriate for this report, it is appropriate to discuss the range of breaches that were calculated for a wide range of intentional events. A summary of the modeling and analysis efforts developed and conducted to calculate the potential breaches from various intentional scenarios is presented in an associated classified report [Hightower 2004].

Many reports currently published postulate a potential hole size of as much as 20 – 25m^2 from a major accident or intentional breach. A computational shock physics code, CTH, and material data were used to calculate expected breach sizes for several different intentional scenarios. CTH is Eulerian finite volume code and is required to estimate and analyze the large-scale deformations and material responses under very high strain rates that a developed due to high velocity penetration or explosion scenarios.

Several different intentional breaching scenarios were evaluated. They ranged from sabotage and hijacking to other types of physical attacks. The intentional scenarios evaluated included those events deemed credible from intelligence and historical data. A credible event means that a group (or groups) could have the general means and technical skill to accomplish successfully an intentional breach.

Based on the analyses for both LNG tanker designs, the range of hole sizes calculated from an intentional breach of an LNG cargo tank is between 2 – 12 m^2. Our analysis suggests that, in most cases, an intentional breaching scenario would not cause a tank breach of more than 5 – 7 m^2. This is a more appropriate value to use in calculating potential hazards from spills. As shown in Table 36, it is possible to create a breach in more than one LNG cargo tank under certain intentional scenarios. In addition, in some intentional scenarios, a breach might be such that spilled LNG could stay substantially if not totally within the ship ballast and double hull spaces.

3 LNG BREACH SUMMARY

Based on the breach scenarios identified and evaluated, realistic hole sizes of between 2 – 12 m^2 appear possible. The general sizes are shown in Table 32 for both accidental and intentional breaches. For both LNG tanker designs, a breach could occur in the LNG cargo tanks either above or below the water line. This will impact the amount of LNG spilled onto the water surface and the amount of LNG that might be spilled into the internal ballast areas between the hulls, vacant hold areas, etc.

As shown conceptually in Figure 5, based on the evaluation of the available void space between the hulls, in some cases almost all of the LNG spilled in a breach might be captured

within the LNG vessel. While this will reduce the volume of LNG spilled onto the water and the potential spill surface size, it could negatively impact the structural integrity of the LNG vessel. This has been evaluated and is discussed in Appendix D.

Table 32: Estimated LNG Cargo Tank Breach Sizes for Various Scenarios

BREACH EVENT	BREACH SIZE	CARGO TANKS BREACHED
Accidental Collision with Small Vessel	none	none
Accidental Collision with Large Vessel, (90° @ 7 knots)	none	none
Accidental Collision with Large Vessel, (90° @ 12knots)	5-12m^2 (effective breach: 0.5 – 1m^2)	1
Accidental Grounding	none	none
Intentional Breach	0.5 m^2	1
Intentional Breach	2 m^2	3
Intentional Breach	2-12m^2	1
Intentional Breach	5 m^2	2
Intentional Spill	Premature offloading of LNG	none

The risk of a breach of an LNG cargo tank due to an accident, such as a collision or grounding, appears to be minimal. The risk of such a breach can be easily reduced through a number of operational mechanisms that includes managing ship traffic, coordinating ship speeds, and by active ship control in inner and outer harbors where the consequences of a potential LNG spill might be most severe. The Coast Guard currently uses all these methods. The safety and hazard issues from an accidental breach appear manageable and adequate with current safety policies and practices based on the safety records of LNG vessels in port.

The intentional breaches shown above in Table 32 cover several events, including a range of possible attacks and insider threats. The large hole sizes calculated, while smaller than commonly assumed in many studies, still provide the potential for large LNG spills and need to be looked at closely. A wide range of operational strategies, though, might be available to prevent or mitigate many of the identified intentional breach scenarios.

APPENDIX C
LNG SPILL AND DISPERSION ANALYSIS

1 INTRODUCTION

This appendix provides an in-depth literature review of experimental and technical studies associated with the dispersion and potential thermal hazards of an LNG spill from either an accidental or intentional event. A broad range of potential modeling and analysis issues associated with spills and potential thermal hazards is identified and discussed.

Table 33 provides an overview of existing LNG spill testing data.

Table 33: Largest Spill Volumes Tested to Date Giving Pool Radius and/or Distance to LFL

EXPERIMENT	SPILL SIZE (m^3)	SPILL RATE (m^3/min)	POOL RADIUS (m)	DOWNWIND DISTANCE TO LFL (m) (Max)
ESSO	0.8 – 10.8	9 – 17.5	7 – 14	400
U.S.CC	3 – 5.5	1.2 – 6.6	~ 7.5	Not measured
Maplin Sands (dispersion tests)	5 – 20	1.5 – 4	~ 10	190 ± 20 m
Maplin Sands (combustion tests)	10.35	4.7	~15	Not measured
Avocet (LLNL)	4.2 – 4.52	4	6.82 – 7.22	220
Burro (LLNL)	24 – 39	11.3 – 18.4	~5	420
Coyote (LLNL)	8 – 2 8	14 – 19	Not reported	310
Falcon (LLNL)	20.6 – 66.4	8.7 – 30.3	Not reported	380

2 LIQUID POOL

2.1 Spreading

2.1.1 Experiments

The experiments summarized in the table below, measuring dispersion only, provide information on pool radius. Thus, mass fluxes are due to the heat transfer from water contact and not from fire.

Table 34: Largest Spill Volumes Tested to Date Giving Pool Radius and Max. Flux Rate

EXPERIMENT	VOLUME SPILLED (m^3)	POOL RADIUS (m)	MASS FLUX (kg/m^2 s)
Boyle and Kneebone (Shell)	0.02 – .085 Quiescent water surface (laboratory)	1.97 – 3.63	0.024 – 0.195 Increased with amount spilled & amount of heavy hydrocarbons.
Burgess et al.	0.0055 – 0.36 (pond)	0.75 – 6.06	0.181
Feldbauer et al. (ESSO)	.8 – 10.8 (Matagorda Bay)	7 – 14	0.195
Maplin Sands	5 – 20 (300 m dyke around inlet)	~10	0.085
Koopman et al. (Avocet LLNL)	4.2 – 4.52 (pond)	6.82 – 7.22	Not reported

2.1.2 Models

Several models have been developed for the spread of LNG on water [Otterman 1975] [Georgakis et al. 1979] [Briscoe and Shaw 1980] [Raj and Kalelkar 1974] [Fay 1973] [Hoult 1972] [Might and Perumal 1974]. Otterman and Briscoe provide model-to-model comparisons for spills on the order of 103 – 104 m^3. The majority of models assume that spreading is driven only by gravity, and ignore the action of waves and currents, preferential boiling, and pool break-up.

The following models are typical approaches used to model the spread of LNG on water. These models are being described because they have been compared to experiments and they account for the heat flux to the LNG from water.

Opschoor developed a model for the spread and evaporation of LNG on open and confined quiescent water surfaces [Opschoor 1980]. For unconfined water surfaces, the model assumes that boiling occurs in the film-boiling mode and that no ice formation occurs. For confined water surfaces, the model assumes that, during the spreading phase, no ice formation occurs due to film boiling and that, after spreading, an ice layer forms due to a decrease in the temperature difference between LNG and water such that film boiling cannot be maintained, resulting in contact between the LNG and water. The results were compared with experiments by Shell for spills of 38kg (.09 m3) [Boyler and Kneebone 1973]. There was agreement with evaporation rate for confined water surfaces for the ice formation period, and fair agreement for confined water surfaces for pool

radius. When compared to experiments by the U.S. Bureau of Mines (163 kg), the model under-predicts the pool radius over time [Burgess et al. 1970].

Waite incorporates heat transfer, preferential boil-off of methane (90%) and ethane (10%), and gravity spreading of the pool [Waite et al. 1983]. The model was compared to experiments conducted by U.S. Bureau of Mines [Burgess et al. 1970] and Shell [Fay 1973], which had spills of 163 kg (0.36 m^3) and 38 kg (.09 m^3), respectively. Assuming a heat flux typical for film boiling (~25 kW/m^2), the model had fair agreement, within 20%, on the pool radius found in these experiments. This heat flux value gave better agreement than the heat flux typically assumed of 100 kW/m^2. No ice formation occurred for unconfined spills.

Brandeis and Ermak developed a numerical model based on the depth-averaged, shallow water equations [Brandeis and Ermak 1983]. Instantaneous and continuous spills that included the effect of mass and heat transfer, shear forces, and surface tension were modeled. Pool break-up was accounted for by including the effect of shear forces and surface tension. It was found that the time necessary to reach a steady-state radius for continuous spills increased as surface shear stress increased. The steady-state pool radius was not affected. The results were compared to experiments performed by Boyle and Kneebone on a 0.0817 m^3 spill, and indicated good agreement.

Cavanaugh developed a code (LSM90) that simulates multi-component spills on land or water that accounts for flashing liquid, entrainment as aerosol, liquid pool evaporation, and heat and mass transfer effects [Cavanaugh et al. 1994]. Spreading is driven by gravity and the actions of waves are not modeled. Results were compared to the Esso [Feldbaur et al. 1972] and Burro [Koopman 1982] series of experiments. The difference between experimental and computed results for evaporation rate varied from 1 – 48%, with eight out of ten cases within 14%. The average difference for pool size comparison was 12%. The spill size for which the comparison was made was not stated.

2.2 Pool Boiling

2.2.1 Experiments

Boe performed laboratory scale experiments with liquefied methane-ethane and methane-propane mixtures boiling on water [Boe 1998]. The results indicated that addition of ethane or propane affects the boil-off rate. High initial boil-off rates were observed for methane rich mixtures similar to that of typical LNG compositions. The boil-off rates increased by a factor of 1.5 – 2 from that of pure methane, when either ethane or propane was added to methane to obtain a 97% methane mixture. It was concluded that there is a breakdown of film boiling due to closer contact between the mixture and water, causing a higher heat flux and lower surface temperature below that to maintain a continuous vapor film.

Results by Drake on laboratory scale experiments showed that LNG had a higher boiling rate than pure methane on a bound-free surface [Drake et al. 1975]. The rate of boiling increased with time and foaming of the LNG occurred on the water surface. These

results agree with Valencia-Chavez and Reid on laboratory scale confined spills [Valencia-Chavez and Reid 1979].

2.2.2 Models

Conrado and Vesovic developed a model to investigate the influence of chemical composition on the spill behavior of LNG and LPG for unconfined water surfaces [Conrado and Vesovic 2000]. Spreading based upon a gravitational-inertia balance, heat transfer, and vaporization was included in the model. They point out that preferential evaporation occurs and that boiling does not take place at a constant temperature. They found that a decrease in the rate of vaporization, due to the change in composition of the pool, occurs in the later stages of the pool. The vaporization rate for LNG versus methane was found to be different. By not considering preferential boil-off, this would result in underestimating the evaporation time by about 20%. For instantaneous spills, results indicate that neglecting evaporation while spreading is a reasonable assumption. They conclude that models should use the properties of LNG as opposed to those of pure methane.

2.3 Rapid Phase Transition (RPT) Explosions

2.3.1 Experiments

Coyote Tests - 1981 [Goldwire et al. 1983] [McRae et al. 1984] [Morgan et al. 1984] [Rodean et al. 1984] [Ermak et al. 1983] [Ermak et al. 1982]

The Coyote series is a continuation of the Burro test series to further study combustion hazards and rapid phase transition (RPT) explosions. They were performed by Lawrence Livermore National Laboratory (LLNL) and the Naval Weapons Center at China Lake, California, and sponsored by the U.S. DOE and the Gas Research Institute. To study RPTs, 13 spills of 3 – 14 m^3 with flow rates of 6 – 19 m^3/min were performed with fuel of varying ratios of methane, propane, and ethane. Five spills of 8 – 28 m^3 with flow rates of 14 – 17 m^3/min were also performed, obtaining dispersion and combustion data under a variety of meteorological conditions.

Six of the 18 Coyote spills produced RPT explosions. Most were early RPTs that occurred immediately with the spill, and in some cases continued for the duration (over a minute) of the spill. They were generally located near the spill point and appeared to be primarily underwater. Delayed RPTs, occurring at the end of the spill and located away from the spill point out on the LNG pool surface, were also observed. Delayed RPTs occurred on three tests.

The results indicate that, for the spill sizes tested, the pre-spill composition is not a good indication of the likelihood of an RPT. Enger and Hartman from Shell performed a series of small-scale experiments (~0.1 m^3) and found that there is a composition envelope within which RPTs can occur [Enger and Hartman 1972]. The Coyote tests found RPTs occurring outside this envelope, indicating that other mechanisms become dominant for larger spills.

Water temperature appeared be correlated with the occurrence of RPTs. RPTs occurred with the water temperature above 17°C, except for one test in which the water was 11.6°C and the adjustable spill plate was removed, indicating that the depth of penetration might affect the occurrence of RPTs as well. The strength of RPTs was found not to correlate with impact pressure. This is in contrast to what was found for laboratory-scale spills by Jazayeri, in which cryogens were impacted with water and a correlation was found between RPT strength and impact pressure [Jazayeri 1975].

Spill rate was found to correlate with maximum RPT yield. An abrupt increase in the RPT explosive yield was found at around 15 m^3/min, from which the strength increased by five orders of magnitude, to 18 m^3/min. The maximum equivalent free-air, point source TNT explosion that occurred was 6.3 kg for about an 18 m^3/min spill rate.

2.3.2 Models

Vapor explosions have been extensively studied in the nuclear power industry and in the industrial process industry, such as foundries. Research on LNG/water explosions has been principally at laboratory scale [Khalil et al. 1988] [Anderson and Armstrong 1972] [Katz and Sliepcevich 1973]. Several theoretical models have been proposed to explain the formation of RPTs, though none has addressed the large-scale behavior observed in the Coyote experiments. There are several recent reviews of the various theories proposed to explain steam explosions [Berthoud 2000] [Schubach 1996] [Fletcher and Theofanous 1994].

The prevalent theory is the superheat theory, which proposes that film boiling occurs immediately after LNG is spilled on water. Then, due to possible instabilities and a decrease in the temperature difference, the film boiling vapor layer collapses in localized areas, resulting in liquid/liquid contact. This direct contact results in rapid vaporization from the increased heat transfer so that a pressure wave is produced to achieve an explosion. For an explosion to occur, the water must be equal to, or slightly greater than, the superheat temperature of LNG ($\mathbf{T}_{superheat} < \mathbf{T}_{water} < \mathbf{1.1}\ T_{superheat}$). Superheat temperature for methane, ethane, propane, and butane are 168, 269, 326, and 376°K, respectively [Khalil et al. 1988]. The superheat temperature of hydrocarbon mixtures is approximately the mole fraction average of the superheat temperatures of the components [Porteous and Blander 1975].

It has been shown that much different behavior occurs at larger scales, which is not predicted from smaller scale studies. For instance, Enger et al. concluded from laboratory scale experiments that the methane content of LNG must be less than the 40 mole % for RPT explosions to occur; but this was found not to be the case for the much larger spills in the Coyote tests, as previously discussed. It has been shown for both laboratory scale and larger field tests that composition, as well as water temperature, is a factor in the occurrence of rapid phase transitions.

Napier and Roochland raise the issue of rapid phase transitions causing ignition by either electrostatic discharge or frictional sparks created near the explosion, or by shock heating of the methane-air mixture [Napier and Roochland 1984]. Based on using shock tube analysis, they concluded that shock heating of unconfined flammable mixtures of methane to the

auto ignition temperature (813°K) is not possible. The experimentally determined temperature available is 450°K; the theoretical is 500°K. They state that ignition is possible via an electrostatic discharge or frictional sparks; but that these ignition modes are difficult to quantify. The ignition source would have to be located on the boundary of the RPT, where the fuel concentration is between the flammability limits.

3 DISPERSION

3.1 Experiments

The following describes experiments on the dispersion characteristics of vapor clouds formed from LNG spills onto water. Only the largest spill volume tests have been reviewed and discussed. Smaller spill volume tests have been performed and are listed in the recent review on cryogenic spills by Thyer [Thyer 2003].

Shell Jettison Tests – 1973 [Kneebone and Prew 1974]

Shell performed a series of six tests in which LNG was jettisoned from the 'Gadila,' a 75,000 m^3 capacity ship. The primary objectives of the tests were to determine the feasibility of emergency jettison of fuel with high discharge rates while the ship is stationary, as well as low discharge rates while the ship is moving. The flow rates tested ranged from 2.7 to 19.3 m^3/min, lasting a total of ten minutes, and producing total volumes spilled that ranged from 27 to 193 m^3. Four tests were performed while the ship was moving from 3 to 10.5 knots, and two stationary tests were performed, one of which was with the highest volume spilled. The methane, ethane, and propane content by mole percent were 87.11%, 9.05%, and 2.75%, respectively. Two different jet nozzle sizes were used (51 and 102 mm) located 18 m above the water. The relative humidity was between 80 and 85%, and wind speed ranged from 1.9 to 5.1 m/s.

Measurements were taken of the following: ship speed, wind speed and direction, air and seawater temperature, distance of liquid and vapor cloud from the ship, and electrostatic field strength in the jet exiting the nozzle. Concentration measurements were not taken. Infrared camera results indicated that, with the 51 mm nozzle, LNG pools on the sea surface did not form and only isolated patches formed for the 102 mm nozzle. This could be due to the LNG evaporating before it reached the sea surface, because it was released from an elevated horizontal jet. Thus, ice formation or RPT explosions were not observed. It was visually observed that the clouds completely dispersed within 15 – 20 minutes after the discharge was completed for the 102 mm nozzle at a discharge rate of 19.3 m^3/min.

For the highest volume spilled, 193 m^3 (3.9 m/s wind), the visible plume appeared to be uniform over its entire length and had a height of 10 – 12 m, maximum continuous width of 550 m, and length of 2250 m. The length was observed continuing to increase after the test.

Maplin Sands Tests – 1980 [Puttock and Blackmore 1982] [Blackmore and Summers 1982] [Blackmore et al. 1982] [Colenbrander and Puttock 1983]

Tests were conducted at Maplin Sands, England by the National Maritime Institute and were sponsored by Shell. These tests were performed to obtain dispersion and thermal radiation data on 20 spills of LNG and 14 spills of propane onto water. The spill point was surrounded by a 300 m diameter dyke to retain the tide. For instantaneous spills, the spill volumes tested were 5-20 m^3, and for continuous spills, the spill rates tested were 1.5-4 m^3/min. Tests were performed for average wind speeds of 3.8-8.1 m/s.

Results indicate that the LFL is reached within the visible boundary of the vapor cloud for the humidity range of 50-100%. A rapid phase transition (RPT) was observed in one of the instantaneous LNG spills. The maximum overpressure was 18 mbar and damage to the barge used to carry out the instantaneous spill occurred.

The dispersion behavior of the cloud was affected by the method of LNG release. For an underwater release, a more buoyant cloud resulted, whereas with an above water release, a lower and longer downwind cloud resulted. A typical pool radius was roughly 10 m, and the evaporation rate was calculated to be approximately 2×10^{-4} m/s (0.085 kg/m^2s). Using a 3-second average measurement, the maximum dispersion distance to LFL for a spill rate of 3.2 m^3/min and wind speed of 5.5 m/s was 190±20m downwind of the spill.

Burro Tests – 1980 [Koopman et al. 1982, a&b] [Koopman et al. 1978]

The Burro tests were performed by LLNL and the Naval Weapons Center at China Lake, California, and sponsored by the U.S. DOE and the Gas Research Institute. A total of eight LNG releases onto water were performed, with spill volumes ranging from 24 to 39 m^3, spill rates of 11.3 – 18.4 m^3/min, wind speeds from 1.8 to 9.1 m/s, and atmospheric stability conditions from unstable to slightly stable. Dispersion occurred over water for 29 m from the spill source on a pond, then over land for 80 m, where the terrain was irregular with a rise of 7 m. Beyond this point, the land was relatively level.

These tests were preceded by the Avocet series of discovery experiments for 5 m^3 spills [Koopman et al. 1978]. The Avocet tests were performed in order to gain insight into the measurements necessary for the larger spills to be tested in the Burro series of experiments. It was concluded that a large array of instruments would be necessary for larger tests and that wind speed variations have a significant effect on liquid spread and the boil-off rate of the pool.

Measurements of wind speed and direction, gas concentration, temperature, humidity, and heat flux from the ground were made at various distances from the spill and at various elevations. Gas measurements were averaged over a 10-second duration. High-frequency data indicated that significant fluctuations about the 10-second-average occurred such that the flammable extent of the gas cloud will be larger than is indicated by the mean LFL contour.

In one of the tests, the cloud caused displacement of the atmospheric flow and resulted in the wind speed decreasing to almost zero within the cloud. The dense cloud was able to dampen turbulent mixing by stable stratification and, thus, the wind was able to flow over the cloud as if it were a solid object. This test was performed under a low wind speed of 1.8 m/s, slightly stable atmosphere, and spill rate of 16 m^3/min (28.4 m^3). For the other tests with higher wind speeds, this effect was not observed. The cloud was wider and lower in height than that of any other test. The maximum radial distance to LFL at 1 m elevation was approximately 420 m. The cloud also remained over the spill region after the spill ended, in contrast to the other tests, in which the cloud propagated downwind within 10 – 20 seconds after spill termination.

Differential boil-off was observed in the tests where ethane and propane enrichment up to 40% in the cloud occurred late in the spills and propagated downwind up to 140 m. It was also found that a relative increase in absolute humidity is correlated to an increase in gas concentration.

RPT explosions with a maximum overpressure (static) of .72 psi were measured 30 m from the RPT itself. The explosions were strong enough to cause damage to the facility.

Falcon Tests – 1987 [Wiersma and Williams 1989]

The Falcon tests were conducted at Frenchman Flat in Nevada by LLNL and sponsored by the Gas Research Institute and the U.S. DOT. The objectives of the tests were to provide a database on LNG vapor dispersion from spills involving obstacles and to assess the effectiveness of vapor fences for mitigating dispersion hazards. The testing was performed on a 40 x 60 m pond, enclosed by an 88 m long by 44 m wide by 9.1 m high vapor fence. A 22 m wide by 13.7 m high barrier was erected upwind of the pond, in order to simulate the obstruction of a storage tank.

Five tests were performed with spill rates of 8.7 – 30.3 m^3/min (20.6 – 66.4 m^3), wind speeds of 1.7 – 5.3 m/s, and methane concentrations of 88 – 94.7%. Gas concentration and temperature measurements were taken at towers both upwind and downwind of the spill

The test with the highest volume, 66.4 m^3 (spill rate 28.7 m^3/min), and most stable atmospheric conditions (Falcon 1) resulted in the vapor cloud overfilling the vapor fence on all four sides. Pre-spill wind tunnel simulations predicted that the cloud would stay within the fence. It was speculated that this was due to enhanced, turbulent mixing from the high spill rate and partly due to superheating of the LNG from the water beneath. This could not be substantiated, due to insufficient measurements of concentration and temperature in the source area. A maximum downwind distance to LFL of 330 m was measured for this case.

Tests were performed with and without the vapor fence. With the fence in place, the downwind distance to the 2.5% concentration on the ground was reduced from approximately 380 m to 235 m and a substantial reduction in the hazardous areas was achieved. The persistence of the cloud at a 2.5% concentration near the center of the spill

was 530 s with the fence versus 330 s without the fence. Although the fence reduced the downwind distance of the hazardous area and delayed cloud arrival time, it prolonged the cloud persistence time within the fence, thereby prolonging the potential for ignition.

Large RPT explosions occurred approximately 60 sec. after the spill; and a fireball started inside the vapor fence at 81 sec. for Falcon 5, which had a spill rate of 30.3 m^3/min, total volume of 43.9 m^3, and methane content of 88%. Only limited data outside the fence was obtained up to about 100 sec. Rapid phase transitions also occurred with Falcon 3, with a spill rate of 18.9 m^3/min, total volume of 50.7 m^3, and methane content of 91%.

3.1.1 Models

Dense gas dispersion models generally fall into the following categories: Navier-Stokes based, Lagrangian nonlinear puff, shallow layer or two-dimensional integral, one-dimensional integral, and simplified empirical. The following will describe these models and discuss various codes representative of these model types.

Navier-Stokes Based Models

The most complex models are those based on Navier-Stokes. These models computationally solve time-averaged, three-dimensional, turbulent transport equations that come from conservation of mass, species, momentum, and energy balances. Usually, turbulent transport is modeled using a first order, eddy diffusivity approximation, in which eddy diffusion tensors are specified by ad-hoc equations. The most well known code of this is FEM3 [Chan 1992] [Chan et al. 1984] [Chan et al. 1987] [Leone et al. 1985] [Ermak 1982] and its subsequent upgraded versions, up to FEM3C [Chan 1994] [Chan 1997].

Developed by Lawrence Livermore National Laboratory, FEM3 uses a Galerkin finite element scheme in space and a finite difference scheme in time. The latest version (FEM3C) flows over variable terrain and objects, as well as complex cloud structures, such as vortices and bifurcation. Both isothermal and non-isothermal dense gas releases, as well as neutrally buoyant vapor emissions, can be modeled. FEM3C can model multiple simultaneous sources of instantaneous, continuous, and finite-duration releases. FEM3C also incorporates a phase change model that accounts for water vapor interaction in the cloud; and it has the option to use the k-epsilon turbulent transport equations, which is a second order turbulence model.

Limitations of these codes are in the approximations and assumptions that are used to model turbulence and buoyancy effects. They are the most computationally expensive among the model types, but with increasing computing power, this is not as problematic as it was ten years ago or more.

Lagrangian Nonlinear Puff Models

Gaussian puff models are typically for buoyant or neutrally buoyant releases, such as from an elevated stack source. Recently, the code called SCIPUFF (Second-order Closure Integrated Puff), developed by Titan Research and Technology, includes a dense gas release model [Sykes et al. 1999]. SCIPUFF uses a Lagrangian puff dispersion model that captures nonlinear interaction among a collection of Gaussian puffs to represent a

three-dimensional, time-dependent concentration field. Dense gas effects are captured by using the conservation of vorticity moment equation. Turbulent diffusion is based on a second-order closure model. Finite duration, unsteady, and multiple sources can be modeled, as well as flow over flat or complex terrain. Comparisons to dense gas field data on maximum concentration over all sampling locations at a given distance and over the sampling period from Maplin, Burro, and Coyote tests show the model predicting concentration values within a factor of two.

Shallow-Layer Models

Shallow-layer models use equations that assume the lateral dimensions are much greater than the vertical dimension, which is representative of dense gas releases where low wide clouds result. One such model, TWODEE, has been developed for dense gas releases by Hankin and Britter [Hankin 2003] [Hankin and Britter 1999]. Depth-averaged variables are solved in two dimensions (lateral) using the conservation equations. Empirical correlations are used to determine the entrainment rate. The ability to model the effects of complex terrain and phase changes can be incorporated into this model. It is a compromise between Navier-Stokes based models and one-dimensional integral models, though it still requires an order of magnitude greater computational time than one-dimensional integral models.

One-Dimensional Integral Models

One-dimensional integral models such as SLAB [Ermak 1980], HEGADAS [Colenbrander and Puttock 1983] and DEGADIS [Spicer and Havens 1989] use similarity profiles that assume a specific shape for the crosswind profile of concentration and other properties. The downwind variation of spatially averaged crosswind values is determined by using the conservation equations in the downwind direction only. These models include eddy diffusivity models for turbulent transport. The weakness of these models is that they cannot capture flow around obstacles or over complex terrain. The DEGADIS and SLAB models are used widely in the both public and private sectors. In addition to jet releases, both can model buoyancy-dominated, stably stratified, or neutral releases. There are some models of this type, such as GASTAR, developed by Cambridge Environmental Research Consultants (CERC), that incorporate the effect of terrain, such as variable slopes and ground roughness and obstacles, including porous, into the integral formulation.

Empirical Models

The simplest models are modified Gaussian puff/plume models that are principally based upon the conservation of species equation. The downwind concentration profiles are represented by ad hoc equations. The cloud is assumed to have a specific shape with air entrainment occurring at the cloud edges and the interior of the cloud is assumed to have a uniform composition. Empirical models by Germeles and Drake, Fay and Lewis, Burgess et al. Feldbauer et al., SAI, U.S. Federal Power Commission, and U.S. Coast Guard are compared by Havens [Havens 1981].

3.1.2 Model Evaluation Studies

Fifteen integral models, including publicly available and proprietary, were evaluated in a validation exercise by Hanna, et al., in which calculations were compared to data from eight field experiments that included the Maplin Sands, Burro, and Coyote test series [Hanna et al. 1993]. SLAB, HEGADAS, DEGADIS, and GASTAR were able to predict maximum plume centerline concentrations and plume width for these field tests to within a factor of two. It was noted that all of the models were unable to reproduce the variation of concentration with averaging time from field data because they assume that the cloud has a dense gas 'core' that is unaffected by averaging time.

Mercer compared several integral models against one another (and not to experimental data) by considering twenty-five cases that varied in wind speed, atmospheric stability, roughness length, spill volume, and pool radius [Mercer et al. 1994]. For each case, the density of the release was twice that of air and only instantaneous releases were considered. The models varied within a factor of three to five, and the greatest differences among them arose out of the case with low wind speed, F-stability class, and large roughness length.

An evaluation protocol of dense gas dispersion models has been developed through a program called SMEDIS, a European Union research project funded by the Environment and Climate Research Program [Daish 2000] [Carissimo et al. 2001]. Several dense gas dispersion models were assessed from their publication and are listed in Figure 9.

Table 35 shows the data sets to which the models were compared. The evaluation procedure incorporates validation, verification, and scientific assessment for simple, as well as complex, situations that include aerosols, topography, and obstacles. Screening tools, integral models, shallow-layer models and validated CFD models were compared among a dataset of field and wind tunnel data. It was found that all models were globally better at predicting arc-wise measurement, such as centerline maximum concentration, than point-wise statistical measures, suggesting that is more difficult to predict the general cloud shape.

For a particular model type, Tables 36 and 37 show the percentage of model results that were within a factor of two in the experimental results. Table 36 shows results for arc-wise comparison and Table 37 for point-wise comparison. The validated CFD models performed better overall on statistical measures of geometric variance, mean relative square error, and fraction within a factor of two. It was also noted that more information is necessary from field experiments on sensor accuracy and data uncertainty in order to define acceptable agreement with model predictions.

Table 1 The models participating in SMEDIS (HSE = Health and Safety Executiv
Health and Safety Laboratory; CUED = Cambridge University Engineering Departmer
model uses a worst-case approach and has not been included in the statistical analysis (

Model	Developer
Screening tools	
Britter-McQuaid Workbook	HSE and CUED (UK)
VDI Guideline 3783 Part 2	Meteorologisches Institute (Germany)
Integral models	
AERCLOUD	Finnish Meteorological Institute (Finland)
DEGADIS	US Coastguard, US-EPA and Gaz Research Institute (USA)
DRIFT	AEA Technology (UK)
EOLE	Gaz de France (France)
ESCAPE	Finnish Meteorological Institute (Finland)
GASTAR	CERC Ltd. (UK)
GReAT	Risø National Laboratory (Denmark)
HAGAR	BG Technology (UK)
HGSystem	Shell Research (UK)
OHRAT/Multi-stage	Det Norske Veritas (UK/Norway)
PHAST/UDM	Det Norske Veritas (UK/USA)
SLUMP	W.S. Atkins Safety and Reliability (UK)
WHAZAN/HVYCLD	Det Norske Veritas (UK/USA)
Shallow-layer models	
DISPLAY-1	EC Joint Research Centre (Italy)
DISPLAY-2	EC Joint Research Centre, Ispra (Italy)
SLAB	Lawrence Livermore National Laboratory (USA)
SLAM	Risø National Laboratory (Denmark)
TWODEE	HSE/HSL (UK)
CFD Models	
ADREA-HF	NCSR 'Demokritos' (Greece)
CFX	AEA Technology (UK)
COBRA	Mantis Numerics Ltd. (UK)
FLACS	Christian Michelsen Research (Norway)
FLUENT	FLUENT (UK)
KAMELEON FireEx 98	SINTEF (Norway)
MERCURE	Electricité de France (France)
STAR-CD	Computational Dynamics Ltd. (UK)

Figure 9. The Models Participating in the SMEDIS Database and Validation Exercise

[Carissimo, et al. 2001]

Table 35: Dataset Groups Selected Based on Questionnaires Returned by All Participants.

[Carissimo, et al. 2001]

IDENTIFIER	SCALE	MATERIAL	SOURCE TYPE	NUMBER OF TESTS	COMPLEX EFFECTS
Burro	Field	LNG	Pool	8	fast aerosol evaporation
Desert Tortoise	Field	Ammonia	Jet	4	Aerosol
FLADIS-Riso	Field	Ammonia	Jet	16	Aerosol
BA-Hamburg	Wind tunnel	Sulphur hexafluoride	Continuous instantaneous	146	Obstacles, slopes
BA-propane	Field	Propane	Jet-cyclone	51	Aerosol, fences
BA-TNO	Wind tunnel	Sulphur hexafluoride	Continuous instantaneous	13	Fence
Thorney Island	Field	Freon	Instantaneous	30	Fence, building
EMU-Enflo	Wind	Krypton	Continuous	2	Building, real site

Table 36: Arcwise Comp: Fractional Results w/in a Factor of Two of Experimental Results

[Carissimo, et al. (2001)]

MODEL TYPE				
Case with:	Workbook	Integral	Shallow-layer	CFD
No effect	0.40	0.74	0.65	
Obstacle	0.42	0.79	0.53	0.89
Aerosols	0.43	0.69	0.32	0.75
Terrain		0.33	0.67	0.71

Table 37: Pointwise Comp: Fractional Results w/in a Factor of Two of Experimental Results

[Carissimo, et al. 2001]

MODEL TYPE				
Case with:	Workbook	Integral	Shallow-layer	CFD
No effect	0.40	0.42	0.47	
Obstacle	0.30	0.34	0.34	0.54
Aerosols	0.31	0.39	0.36	0.55
Terrain		0.43	0.53	0.77

3.1.3 Model Directory

The Office of the Federal Coordinator for Meteorology (OFCM) has published a directory of a number of transport and dispersion models for the release of hazardous materials into the atmosphere [http://www.ofcm.noaa.gov/atd_dir/pdf/frontpage.htm]. An in-depth compilation and description of the models are provided, as well as model validation and

verification information. No assessment or comparison of model performance is provided.

4 POOL FIRE AND VAPOR CLOUD STUDIES

LNG pool and vapor cloud fire experiments and their results are summarized in Table 38. A detailed description of these experiments is provided in the following sections.

Table 38: Large Scale LNG Fire Studies

STUDY	SPILL TERRAIN	SPILL VOL. (m^3)	SPILL RATE (m^3/min)	POOL DIA. (m)	SURFACE EMISSIVE POWER (kW/m^2)		BURN RATE (10^{-4} m/s) OR kg/m^2 s	FLAME SPEED FOR VAPOR CLOUD FIRES (m/s)
					Pool fire	Vapor cloud fire		
U.S.CG China Lake Tests	Water	3 – 5.5	1.2 – 6.6	15 (max)	220 ± 50	220 ± 30	4 – 11 (measured) (.18 – .495)	8 –17 (relative to cloud)
Maplin Sands	Water	5 – 20	3.2 – 5.8	30 (effective)	203 (avg) (178–248 range)	174 (avg) (137–225 range)	2.1 (calculated) (.0945)	5.2 – 6.0
Coyote	Water	14.6 - 28	13.5 – 7.1	Not measured	Not measured	150 - 340	Not measured	30 – 50 (near ignition sources – decayed rapidly with distance)
Maplin Sands	Land	No report	NA	20	153 (avg) 219 (max)	NA	2.37 (measured) (0.106)	NA
Montoir	Land	238	NA	35	290 – 320 (avg narrow angle) 257-273 (avg wide angle) 350 (max)	NA	3.1 (measured) (0.14)	NA

4.1 LNG Fire Experiments over Water

<u>**U.S. Coastguard China Lake Tests – 1978**</u> [Schneider 1979] [Raj et al. 1979] [Schneider 1980]

A series of 16 tests were performed spilling 3-5.5 m^3 of LNG onto water with spill rates of 0.02-0.11 m^3/s at the Naval Weapons Center. The objective of the tests was to measure the thermal radiation output of two types of LNG fires over water, pool fires and vapor cloud fires. Three type of experiments were performed: immediate ignition of the LNG pool, delayed ignition in which ignition occurred after the spill started but before the evaporation was complete, and downwind ignition of the vapor cloud. Of the 16 tests, 7 were pool fire tests, 3 were delayed ignition tests, and 6 were vapor cloud fire tests.

For pool fires, spot surface emissive powers were obtained near the base of the flame indicating a value of 210 ± 20 kW/m^2 using narrow angle radiometers, and average emissive power for the entire surface of the flame was 220 ± 50 kW/m^2 using wide angle radiometers. These values represent averages over all tests. The percentage of methane in the LNG used for each test varied from 75 to 95 %. The highest spot emissive power of 250 kW/m^2 occurred with the highest concentration of methane. Average flame heights varied from 25 to 55 meters and fluctuated ±10 m for individual tests. The average flame length to diameter ratios varied from approximately 3 to 4, with a peak value of 6. A maximum pool fire diameter of 15 meters was observed.

For the delayed ignition tests, the fire failed to spread rapidly through the fuel, even when multiple flares were used as ignition sources, so that an optically thick flame was not established.

For the vapor fires, surface emissive powers were obtained indicating a value of 220 ± 30 kW/m^2, using narrow-angle radiometers, and 200 ± 90 kW/m^2, using wide-angle radiometers. Vapor fires were observed to propagate along the ground back towards the pool. The flame height to width ratio averaged about 0.5. Flame speed relative to the gas cloud varied from 8 to 17 m/s. Fireballs were not observed for these spill sizes.

The measured regression rates varied from $4x10^{-4}$ to $11x10^{-4}$ m/s. For higher spill rates, it was observed that the regression rates were higher, speculated as possibly due to the interaction between the jet and water effectively increasing the heat transfer area.

Maplin Sands Tests – 1980 [Mizner and Eyre 1983] [Hirst and Eyre 1983]

Tests were conducted on extensive tidal mudflats at Maplin Sands, England by the National Maritime Institute and sponsored by Shell. These tests were performed to obtain dispersion and thermal radiation data on 20 spills of 5 – 20 m^3 of LNG and 14 spill of 13-31 m^3 of propane onto water. The spill point was surrounded by a 300 m diameter dyke to retain the tide. Twenty-four continuous and ten instantaneous spills were performed. Wind speed and direction, relative humidity, and radiation measurements taken with 26 wide-angled radiometers were recorded. Tests were performed in wind speeds from 4 to 8 m/s.

In only 11 tests ignition was possible, 7 LNG and 4 LPG, due to various difficulties. This could be due to the ignition points placed at cloud peripheries where inhomogeneous and lean burn regions exist. Thus, some ignitions did not result in sustained burns. Ignition points were placed 90 to 180 m downwind of the spill point. Radiation and diffusion flame analysis results were reported for 4 LNG tests. Of the four tests reported, 3 were continuous spills with a spill rate range of 3.2-5.8 m^3/min with a spill duration up to 1 minute, and one instantaneous with a spill volume of 12 m^3.

In all of these tests a vapor cloud fire developed, and for one test the vapor cloud fire propagated back to the spill point for a pool fire to form. This pool fire lasted only for a few seconds before the fuel ran out and did not have time to develop completely. As noted by the authors incomplete photographic records also made the analysis of this test

difficult. In order to determine surface emissive power the pool fire was modeled as a tilted cylinder. An effective pool diameter was calculated by approximating the actual flame base area as an ellipse. An effective pool diameter of 30m (crosswind) was calculated for the LNG pool fire. From this test, an approximate fuel regression rate of 2.1×10^{-4} m/s was calculated. For the LNG pool fire, an average surface emissive power of 203 kW/m^2 with a range of 178-248 kW/m^2 was measured.

The flame propagated in the vapor cloud in two modes: as a pre-mixed weakly luminous flame that moved downwind from the ignition point, and as a luminous diffusion flame that moved upwind and propagated through the fuel-rich portions of the cloud and burned back gradually to the spill point. Video recordings indicated that pre-mixed burning took place in gaps in the vapor cloud and that the fuel/air concentration was not homogenous. Expansion of the combustion products principally took place vertically.

Diffusion flame propagation speeds of 5.2-6.0 m/s, and average pre-mixed flame propagation speeds of 5 m/s moving with the wind, were measured. The wind speed range was too narrow to determine possible flame propagation dependency on wind speed. Flame generated overpressures were under 0.4 mbar.

In one continuous spill test the pre-mixed flame propagated through the vapor cloud up to 130 m from the spill point. The flame height-to-width ratios of the vapor cloud fires were in the range of 0.2 to 0.4. For vapor cloud fires, an average surface emissive power of 174 kW/m^2 with a range of 137-225 kW/m^2 was measured.

Coyote Tests – 1981 [Rodean et al. 1984]

The Coyote tests were performed by LLNL and Naval Weapons Center at China Lake, California and sponsored by the U.S. DOE and the Gas Research Institute. The burning of vapor clouds from LNG spills on water were studied in order to determine fire spread, flame propagation, and heat flux. Data on 4 spills of 14.6-28 m^3 with flow rates of 13.5-17.1 m^3/min were performed with fuel of varying ratios of methane, propane, and ethane. Tests were performed in wind speeds from 4.6 to 9.7 m/s and atmospheric stability conditions from unstable to neutral. Gas concentration measurements were averaged over a 2 s period.

The ignition point was located near the cloud centerline about 60 to 90 m downwind of the spill source, and ignition was performed using either a flare or a jet. The flames were observed to begin near the center of the cloud and propagate radially outward, downwind and upwind toward the spill source. Both visible yellow luminous and transparent flames were observed. Pool fires occurred but measurements were not taken.

It as found that the pre-ignition 5%-gas-concentration contours are not indicative of the potential burn area and its location. The actual burn area was observed to propagate further downwind and to the sides than indicated by the pre-ignition contours. The instantaneous 5% gas concentration contours closely coincided with the burn region when 2-s-averaging of concentration measurements were used.

In the test with the highest flow rate or total volume spilled (17.1 m^3/min or 28 m^3), rapid phase transition (RPT) explosion increased the distance to the downwind LFL by about 65% and the total burn area by about 200%. The flame extended up to 280 m downwind and had a maximum width of 60 m. The authors note that the increase was caused by an increased source rate and by enrichment in higher hydrocarbons. The puffs of vapor from the RPT explosions cause momentary increases in concentration as they propagate downwind.

The test conducted in the lowest wind speed and most stable atmospheric conditions had the broadest vapor fire cloud with a maximum width of 130 m and downwind distance of 210 m, and it displayed a bifurcated structure.

Flame heights appeared to vary directly with the pre-ignition height of the combustible mixture near the ignition source. The ratio of flame height to cloud height varied from 5 to 10. The clouds were 3-8 m in height. Flame speeds with peak values of 30 m/s were observed near weak ignition sources and 40-50 m/s for strong ignition sources. Speed decreased as a function of distance from the source and no flame acceleration was observed. Overpressures of only a few millibars were measured, not enough to cause damage.

Heat flux (radiative and convective) measurements inside the vapor cloud fires were found to be in the range of 150-340 kW/m^2. External radiative flux values for the bright yellow portion of the flames were in the range of 220-280 kW/m^2 using wide and narrow-angle radiometers. These measurements were noted as being suspect because the sensors were not protected by a heat sink or water-cooling. This resulted in the sensors heating up and the signal becoming distorted as the heat load increased. This was true for all but one test that did not have the sensor engulfed by the flame.

4.2 LNG Fire Experiments Over Land

Maplin Sands Tests – 1982 [Mizner and Eyre 1982]

Tests sponsored by Shell were performed to measure the thermal radiation from 20m diameter land-based pool fires of LNG, LPG and kerosene using both wide and narrow-angle radiometers. The following were also measured: mass burning rate, fuel composition, wind speed and direction, relative humidity, and metal surface temperatures close to the fire. Video and still photographs were taken upwind and crosswind of the fires. The average surface emissive power was determined by measurements made using wide-angle radiometers and the use of a solid flame model representing the flame as a tilted cylinder. One test was performed for each fuel.

The flame appeared roughly cylindrical in shape and tilted due to a 6.15 m/s wind. For the LNG fire the production of black soot appeared much higher in the flame and was significantly less than that produced by LPG or kerosene. The measured mean flame length using video recordings for the LNG fire was 43 m with a flame length-to-diameter ratio of 2.15. The Thomas correlation for flame length-to-diameter ratio predicts a value of 1.88, if the measured burning rate is used, underestimating the observed mean flame

length by 12.6%. The measured burning rate was 0.106 kg/m^2s (2.37×10^{-4} m/s) for LNG, versus 0.13 kg/m^2s (2.17×10^{-4} m/s) for LPG.

The average surface emissive power for the LNG pool fire was 153 kW/m^2, while LPG had a much lower value of 48 kW/m^2, due to the greater smoke shielding. The maximum measured value using narrow-angles radiometers for the LNG fire gave values up to 219 kW/m^2.

<u>Montoir Tests – 1989</u> [Nedelka et al. 1989]

These tests were collaboration among many sponsoring companies: British Gas, British Petroleum, Shell, Elf Aquitaine, Total CFP, and Gaz de France with tests performed by British Gas, Midlands Research Station, Shell, and Thornton Research Center. Tests on 35m diameter LNG pool fires on land were performed at a facility near the Montoir de Bretagne methane terminal.

Three LNG pool fire experiments over a wind speed range of 2.7 to 10.1 m/s were performed. The maximum volume of LNG poured into the 35 m diameter bund was $238m^3$. The following were measured: flame geometry, incident thermal radiation at various ground level positions, spot and average flame surface emission, gas composition in pool, fuel mass burning rate, and flame emission spectra in both the visible and infrared regions.

Small regions of the flame were examined using a narrow angle radiometer. These measurements correspond to 'spot surface emissive power' values, whereas average surface emissive power measurements use wide angle radiometers and refer to an average over the flame surface and are interpreted based upon the flame shape. Two types of average surface emissive powers were employed: one based upon an idealized cylindrical flame shape that includes the smoky part of the flame, and the other based from cine photographs that represent the actual areas of clear flame.

A mass burn rate for a methane fire was obtained as long as the methane concentration in the pool was above 40%, or when vapors above the pool were measured to have at least 99-mole percentage methane content. During the methane pool fire burn time, the ethane content in the vapors above the pool was less 0.2-mole %. Keeping the methane content in the pool above 40% avoided the high smoke shielding that can occur from the ethane or propane in the fuel and the decrease in the mass burn rate from the increased conduction into the fuel due to higher boiling points of ethane or propane.

It was observed that the fires had an intensely bright region extending from the base to at least half of the total flame height, and the rest was obscured intermittently by smoke, which was much more than that produced in a 20m diameter LNG fire. The shape of the fire was observed to be complex and was noted as difficult to represent using simple geometries.

The average mass burning rate among the 3 fires was 0.14 kg/m^2s.

Flame drag ratios up to 1.29 for high wind speeds, and 1.05 for low wind speeds were measured. Flame drag ratio is defined as the flame base length in the direction of the wind divided by the pool diameter

At 140 m from the burn center, the incident thermal flux was measured as approximately 15 kW/m^2 downwind, 5 kW/m^2 crosswind, and 3 kW/m^2 upwind during a wind speed range of 7.0 – 10.1 m/s.

In the lower 10 m of the flame, typical time averaged spot surface emissive powers of 290 – 320 kW/m^2 were measured in the crosswind direction. Values up to 350 kW/m^2 averaged over 5 – 10 s periods were measured. These values are much greater than that of smaller pool fires where at comparable positions, values of 140 – 180 kW/m^2 for a 6.1m diameter fire and 170 – 260 kW/m^2 for a 10.6m diameter fire has been observed.

Average surface emissive power values in the range of 230 – 305 kW/m^2 from individual instruments were measured. Average values for each experiment were in the range of 257 – 273 kW/m^2. These were based upon a flame shape using cine photographs. Values were also obtained by utilizing a flame shape based upon a tilted cylinder with length calculated from the Thomas equation and tilt angle from the Welker and Sleipcevich equation. The values obtained were much lower with a range of 130 – 180 kW/m^2. With both methods, the average surface emissive power was plotted for pool diameters of 6.1, 10.6, 20, and 35. The graph indicated that the rate of increase of the average surface emissive power for increasing pool diameter is decreasing. The authors note that it is not expected that a much greater value would be obtained for larger pool fires.

4.2.1 Models

Generally, three approaches can be identified to model thermal radiation from pool fires. These models are classified as point source, solid flame, and field. Schneider provides a review of the first two models and various vapor cloud and fireball models pertaining to LNG [Schneider 1980].

The simplest model is the point source model, in which the emission of thermal radiation is treated in a global manner by assuming the radiation source is a point and that the radiation decays as the inverse square of the distance from the source. An assumed fraction of the heat of combustion is used to approximate the thermal radiation emitted, the uncertainty of which increases with large pool fires due to the lack of data. It is also assumed that the receiving surfaces are oriented to receive the maximum thermal radiation. The near field, approximately 3 – 5 diameters, cannot be captured with this model because the geometric considerations between the emitting flame and receiving surfaces become important. Radiation attenuation in the atmosphere is also not accounted for with this model. The effects of wind tilting the flame and the presence of objects interacting with the flame cannot be captured. This model is not a typical approach used today, but was a first attempt to capture the thermal radiation from pool fires.

The next level of complexity is the solid flame model, which configures the surface of the flame with a simple geometry, usually cylindrical [Brown et al. 1974] [Raj and Atallah 1975] [Lautaski 1992] [Johnson 1992]. The thermal radiation is emitted uniformly from this surface and the total radiant power is based upon empirical correlations with pool diameter. Modeled is the geometric view factor, which is the fraction of radiant energy that is received by an object's field of view. Also accounted for is the attenuation of the thermal radiation in the atmosphere. In order to capture the tilting of the flame due to wind, a tilted cylindrical flame shape is typically used. Flame length, tilt and drag necessary to determine flame shape and view factors, are based upon empirical correlations. For pool fires with simple pool geometries, these models provide good agreement with experiment. Johnson found agreement within one standard deviation from the average measured heat flux for a range of pool sizes, 1.8 – 35 m in diameter. The disadvantage of these models is the inability to model more complex flame shapes such as those arising from complex pool shapes or object interaction with the flame.

The most sophisticated models are the validated field models (CFDs) that incorporate the equations that govern fluid flow; that is, Navier-Stokes. Because pool fires are turbulent for the scale of interest, turbulence models are used, typically the k-epsilon model. Combustion models typically assume that combustion is mixing-controlled, rather than controlled by the chemical reaction time. The radiant transport equation along with simplifying assumptions is used to model thermal radiation. Soot models are also incorporated, which invoke empirical models.

Simplified models, such as the solid flame model, have been typically used for thermal hazard zones that assume a circular pool. The point source model has also been used, which assumes that the fire originates from a point, implying that the pool is uniform from the point. For a spill scenario with no object interaction, this is a logical geometrical shape to assume for the pool. If there is object interaction, an oval or rectangular configuration could occur; for example, a trench fire, which is a pool fire with a rectangular configuration. It is of interest to compare the performance of the point source model and solid flame model to such a configuration. Thus, both models were compared to a trench fire [Croce et al 1984].

Comparison was made with a trench dimension of 23.5 x 1.83 meters. The measured wind speed was 1.83 m, average flame length 3.4 m, flame tilt 56.8 degrees, flame drag ratio 2.96, burning rate .054 kg/m^2 s, and average surface emissivity of 135 kW/m^2. The radiative fraction used for the point source calculation was .348, based upon a relation by Moorhouse and Pritchard for radiative fraction as a function of surface emissive power and flame height to diameter ratio. The effective pool diameter is 7.4 m for the given trench dimensions. Thus, the surface emissive power and flame height to diameter ratio was taken into account through the radiative fraction value. The flame height to diameter ratio of 1.49 was calculated using a Moorhouse correlation that includes the effect of wind. The measured burn rate value from experiment was also used for the point source calculation. The view factor for a tilted cylinder to an object was calculated by formula derived by Sparrow [Sparrow 1963].

Figure 10 indicates that both models over predict the measured heat flux at most crosswind, upwind, and downwind locations. The point source model slightly under predicts the heat flux at intermediate distances. The comparison to downwind provides the best agreement to experiment, about five pool diameters from the pool center for the point source model. The percent difference between the experimental data and the point source model results for heat flux measurements downwind range from 4 to 30%, crosswind from 33 to 228%, and upwind from 218 to 293%. The solid flame model predicts a much higher heat flux value, because the predicted flame height for the assumed circular pool is much higher than the experimental value, 11 m vs. 3.4 m. Thus, the discrepancy can principally be attributable to flame break up.

The experiments showed the flame breaking up into flamelets, or individual fire plumes. Thus, the flame height is shorter than that of a circular pool fire with equivalent area. This comparison indicates that the point source model and the solid flame model do not accurately predict heat flux levels when the pool is non-uniform, such as would occur when there is object interaction.

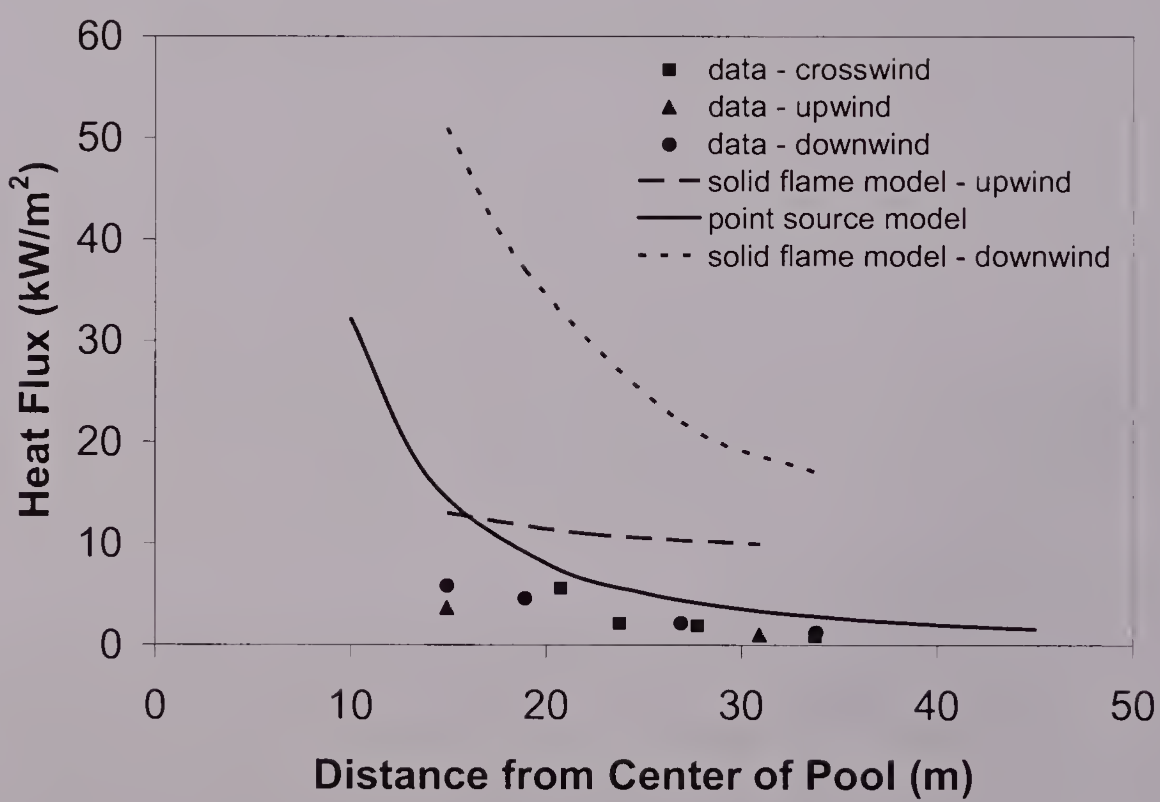


Figure 10. Flame Model Comparison with Trench Fire Data

The disadvantage of field models is the computational running time compared to integral models that represent the fire as cylindrical flame. Although, with the emergence of more powerful computers, this is less problematic. These codes can now be run on personal computers and workstations, instead of super computers. The advantage of field models is that complex flame shapes can be captured, such as that arising from object/flame interaction as from an LNG ship and a pool fire, for example. Vapor cloud fires and fireballs can also be modeled with these codes.

Various field models are available, such as FLACS, CFX, Phoenics, Kameleon, and Vulcan. These codes vary in their capability to model explosion, fireballs, flash fires, and/or pool fires.

4.3 Detonation Studies

U.S. Coastguard China Lake Tests – 1978 [Parnarouskis et al. 1980] [Lind and Witson 1977]

Tests were performed in a detonation tube and 5m and 10m radius hemispheres. Both explosive-initiated and spark-ignited tests were performed on methane-air and methane-propane mixtures. For the detonation tube experiments, the methane-air mixture did not detonate using a 5 g or 90 g booster, nor did it detonate with spark ignition. Methane-air mixtures did not detonate with explosive charges up to 37 kg for the 10m diameter hemisphere tests. Methane-propane mixtures of 60-40, 70-30, and 85-15 did detonate using a 1 kg high explosive booster for the 5m hemisphere tests

Experiments were also performed to test a postulated accident scenario in which the vapor formed during an LNG spill mixes with air to form a flammable mixture and then diffuses into a culvert system. The mixture in the culvert ignites and the combustion wave accelerates then transitions to a detonation that exits the culvert and detonates the remaining unconfined vapor cloud. The detonation charge used in the culvert was a 13 kg explosive. Detonations in the vapor mixture occurred when propane concentrations were 6% or greater and the culvert measured 2.4 meters in diameter. From these detonations, the shock wave was felt at a town 22 km from the test site.

Vander Molen and Nicholls – 1979 [Vander Molen and Nicholls 1979]

Experiments were performed to measure the effect of ethane addition to methane air clouds on detonation. A stoichiometric mixture with air was maintained for every mixture of methane and ethane tested. The ethane concentration ranged between 0 and 5.66% by volume of the total methane-ethane-air mixture or, equivalently, 10% to 50% by volume of the fuel mixture. The experiments were performed using a sectored shock tube of 147.6 cm radius and 5 cm width to model a 20-degree pie shaped sector of a cylinder cloud. A stable detonation was characterized as a wave propagating with a non-decaying constant velocity. For an ethane content of 1% by volume in the methane-ethane-air mixture or a 10% ethane by volume content in the fuel, 5.5 grams of condensed explosive or critical initiating blast energy of 25,000 J/cm was needed to result in a detonation.

4.3.1 Reviews

There have been several reviews on detonations of hydrocarbon/air mixtures [Lee and Moen 1980] [Moen 1993] [Nettleton 2002]. It was pointed out by Moen that weak ignition of vapor clouds in an unconfined and unobstructed environment is unlikely to result in a deflagration to detonation (DDT), even for more sensitive fuel/air mixtures; but it is likely with confinement and the presence of obstacles [Moen et al. 1980]. The occurrence of DDT depends upon the degree of confinement, obstacles configuration, ignition source, initial turbulence, and the fuel-air mixture. Nettleton indicates that the understanding of how confinement, temperature, pressure, and mixture composition influence the initiation

source and distance to DDT is not complete. Further work must be done before prediction can be made whether DDT will occur for any given spill scenario.

4.3.2 Flame Acceleration Studies

Moen et al. – 1980 [Moen et al. 1980]

This is a series of works performed at McGill University in Montreal, Canada, on flame acceleration and deflagration to detonation transitions [Chan et al. 1983]. The influence of obstacles on flame acceleration of methane/air mixtures was investigated in a cylindrical vessel 30.5 cm in radius. The effect of obstacles was to increase flame speed of up to 130 m/s, 24 times the velocity without obstacles. The high flame speeds could only be maintained with repeated obstacles, which provide large-scale flow field distortions associated with flame acceleration.

Urtiew – 1982 [Urtiew 1982]

The work was motivated by the possibility that terrain or obstacles might create semi-confined flame paths that could lead to flame acceleration. Flame acceleration of propane-air mixtures in semi-confined geometries with obstacles was investigated. Propane-air mixtures were spark-ignited in an open top and end test chamber, 90 cm long, 30 cm high, and 15 cm wide. It was found that obstacles caused the flame to accelerate from 2 – 3 m/s up to 4 – 6 m/s. Further flame acceleration up to 20 m/s occurred when the obstacles were raised slightly above the chamber floor and by varying the location of the ignition source. It was concluded that further work is needed to determine the mechanisms leading to continuous acceleration in semi-confined geometries.

Harrison and Eyre – 1987 [Harrison and Eyre 1987]

A series of tests was performed to investigate the effect of obstacle arrays on flame acceleration of pre-mixed natural gas/air and propane/air mixtures. A wedge-shaped enclosure was used which had an open top and bounding sidewalls forming a 30 degree wedge of 30 meters long and 10 meters high. This aspect ratio was used so that a shape representative of a dense cloud would be modeled.

A series of horizontal pipes were placed in the wedge to provide optimal flame acceleration. Blockage ratios of 20 and 40 percent based upon the percentage of the obstacle grid were used. Unobstructed and obstructed tests were performed using a low energy fuse head igniter. The effect of grid height, blockage ratio, grid spacing, and the total number of grids was investigated. Unobstructed LNG/air mixtures produced low flame speeds of 8 – 9 m/s in the first few meters and overpressures of 4 – 5 mbars, which decayed with a 1/r relationship in the far field.

Grids with low blockage ratios or low height produced overpressures of 29 – 63 mbars decaying as 1/r and flames speeds of 37 – 51 m/s, not sufficient to cause severe structural damage. The test with the great congestion obtained a maximum flame speed of 119 m/s and overpressure of 208 mbars decaying as 1/r, which can be sufficient to cause structural damage to buildings in the immediate vicinity of the cloud. In all tests, flame speed and overpressures decayed rapidly after the flame emerged from the grid of obstacles,

typically within 5m of the last grid. Thus, the size of the obstacle array, not the size of the gas cloud, defined the size of the pressure source.

Shell – 2001 [Bradley et al. 2001]

Flame acceleration was investigated in a vented box structure, 10 m long, 8.75 m wide, and 6.25 m high using methane/air and propane/air mixtures ignited using a conventional spark plug. Results indicate that an initial stable and subsequent unstable flame propagation regime occurs. In the unstable regime, instabilities grow to wrinkle the flame and increase the flame speed. Flame speed measurements up to a radius of approximately 3 m indicate that flame speed increases with radial distance and varies as the square root of time. Past this distance, the walls of the test structure interfered with flame propagation.

5 DISCUSSION

There are many theoretical and experimental gaps related to understanding the dynamics and subsequent hazards of an LNG spill on water. Filling some of the gaps is currently impossible due to experimental and computational limitations. The following discussion addresses gaps that can be filled with current capabilities, and is indicative of first priorities to improve abilities to address hazards associated with an LNG spill.

There is a large disparity between the available experimental data and the scales of interest. Figure 11 shows a comparison of the spills sizes tested to date and that are possible from a single LNG cargo tank for a large hole. Table 38 specifies spill volumes tested, spill rate, pool radius, and distance to LFL for these various tests. The available experimental results are two to three orders of magnitude less than the scales of interest. It is evident that there is a lack of large-scale spill data for model comparison.

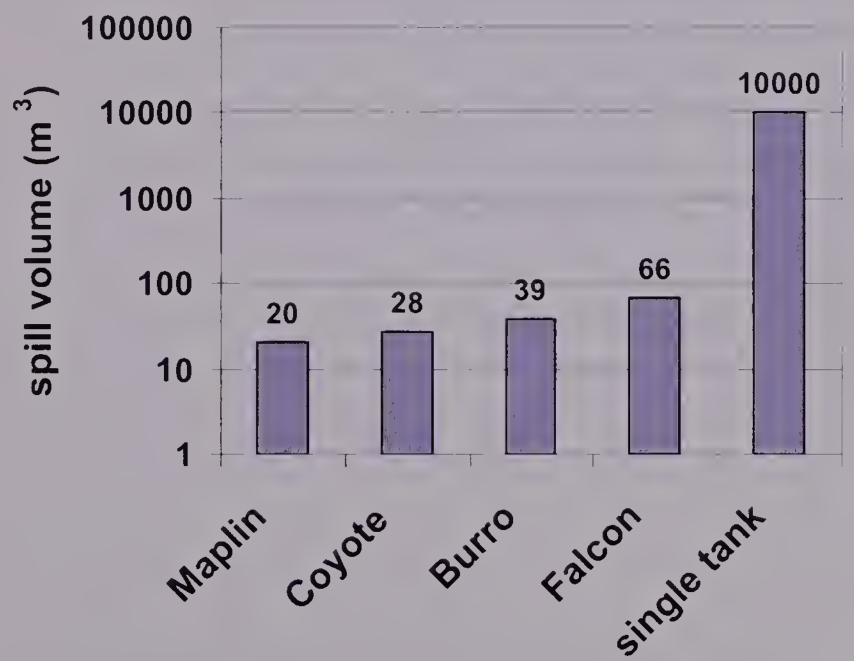


Figure 11. Log Scale Comparison of Experimental Spills vs. Possible Cargo Tank Spills

- Of the larger spill tests performed, there have been only a few LNG pool fires on water tests where measurements were taken. This was for a spill size of 10.35 m^3, which is far below the spill volume that could occur for a 2 or 12m^2 hole in one tank of a vessel. This pool fire lasted only for a few seconds before the fuel ran out and did not have time to fully develop. It was also noted that photographic records necessary for analysis were incomplete. In order to determine the thermal radiation hazard from a pool fire, the surface emissive power needs to be determined. The pool fire tests on land indicate that the surface emissive power increases for pool diameters up to 35 m. Whether the maximum surface emissive power was obtained is uncertain, though most likely it isn't much higher than that measured for 35 m. It is difficult to determine whether the surface emissive power and the pool mass flux has leveled off for pool fires on water since only one test of

a larger scale has been performed. Thus, more data on large-scale LNG pool fires on water is needed. More tests on the order of spill volumes of 10 m^3 should be performed, and ideally on the order of 100 m^3, so that maximum surface emissive powers and pool mass fluxes are reached. Also, at these larger scales, a regime may be revealed at which a single coherent pool fire cannot be maintained, but rather a break up into multiple pool fires occurs.

- LNG pool fire simulations on water using a field or validated CFD dynamics code have only recently begun to be used. These codes can capture object interaction with the flame as well as vapor cloud fires. A simulation of a pool fire and its impact on the LNG ship will provide improved estimates of cascading damage.
- Probability of ignition of the LNG from initial damage is uncertain for some initiating events and should be experimentally investigated.
- It is questionable whether the spill sizes investigated to date give an indication of the atmospheric dispersion that would occur for very large spills. The significance of the Burro tests results for the dense cloud displacement effect is that the cloud does not dissipate as quickly due to the lack of turbulent mixing and thus will persist for a longer time. This result has hazard implications that might be more profound for very large spills in which the mass of the dense cloud will be greater.
- The achievable overpressures of RPT explosions for very large spills (~ 100 m^3/min) and the possible upper bounds of damage to structures have not been evaluated.
- Determining the spreading and vaporization of the LNG pool is instrumental in determining the evolution of the vapor cloud and subsequent related hazards. If this part is performed incorrectly, the rest of the analysis is severely affected. This feature was evident from the recent four studies that were compared. The prominent issue raised from the comparison is the effect of waves on spreading and vaporization. Wave action would increase the evaporation rate due to the increased surface area and increased heat transfer rate from the lower levels of the water due to the mixing action of the waves. Traveling waves would irregularly spread the LNG pool. The effect of waves on spreading and vaporization should be investigated experimentally, and a free-surface code such as FLOW-3D should be used to simulate spills at the larger scales.

APPENDIX D
SPILL CONSEQUENCE ANALYSIS

1 INTRODUCTION

]A wide range of experimental information on LNG spills and associated analyses must be considered and evaluated in an effort to assess the potential consequences of the breach and associated spill of an LNG cargo tank. The consequences or potential hazards to the public of a large LNG spill over water will depend on:

- Potential damage to an LNG cargo tank from either an accidental or intentional breach and the size, location, release rate and volume of LNG spilled;
- Environmental conditions such as wind, tides and currents, and waves that could influence the spread or orientation of a potential LNG spill over water;
- Potential hazards resulting from an LNG spill over water, such as cryogenic damage or thermal damage to the vessel or other LNG cargo tanks, which might lead to cascading failures of additional LNG cargo tanks or several damage to the LNG vessel;
- The location and magnitude of a potential LNG spill where the hazards from a spill, such as fire and thermal radiation, might impact or damage other critical infrastructures or facilities such as bridges, tunnels, petrochemical or power plants, government buildings or military facilities, national icons, or population or business centers; and
- Potential impact on the regional natural gas supplies from the damage of an LNG vessel, unloading terminal, or loss of use of a waterway or harbor due to the immediate or latent affects of a spill.

The risk-based assessment approach discussed in Section 3 of the main body of this report and the event tree in Figure 4 was developed for potential LNG breaches and associated consequences, and provides the basis for evaluating the potential events that might ensue from either an accidental or intentional breach of an LNG cargo tank and are discussed in this Appendix.

2 ASPHYXIATION POTENTIAL AND IMPACTS

Methane, an ingredient of LNG, is considered a simple asphyxiant; but it has low toxicity to humans. In a large-scale LNG release, the cryogenically cooled liquid LNG would begin to vaporize upon its release due to the breach of an LNG cargo tank. If the vaporizing LNG does not ignite, the potential exists that the LNG vapor concentrations in the air might be high enough to present an asphyxiation hazard to the ship's crew, pilot boat crews, emergency response personnel, or others that might encounter an expanding LNG vaporization plume.

To date, experimental data show that vaporization from an LNG spill tends to spread essentially in a cigar-shaped, disk pattern due to the high-density characteristics of LNG. The vapor cloud spreads out in a mostly broad, flat configuration, generally with a plume of

10 – 30 feet in height. This is much different from the traditional Gaussian-type distributions, most often assumed for atmospheric dispersion of many common pollutants.

Beard described a study of the effects of hypoxia on the cognitive abilities of 100 test subjects in a low-pressure chamber. The threshold for reduced mental performance occurred at an oxygen partial pressure of 85 torr for three of the test subjects. This is equivalent to an oxygen concentration of 11.1 % at sea level. Approximately 75% of the test subjects showed reduced mental performance at 65 torr oxygen pressure, which is equivalent to 8.5 % oxygen at sea level. These data were most likely obtained on a cohort of physically fit, medically qualified individuals.

ANSI Z88.2-1992 provides the data in Table 39 for inhalation of air that is deficient in oxygen [ANSI 1992].

Table 39: Response of a Person to Inhalation of Atmosphere Deficient in Oxygen

% O_2 AT SEA LEVEL	OXYGEN PARTIAL PRESSURE (mmHg)	PHYSIOLOGICAL EFFECTS
20.9	159	Normal
19	144	Some adverse physiological effects, but they are unnoticeable.
16	121	Impaired thinking and attention. Reduced coordination.
14	106	Abnormal fatigue upon exertion. Emotionally upset. Faulty coordination. Poor judgment.
12.5	95	Very poor judgment and coordination. Impaired respiration that might cause permanent heart damage. Nausea and vomiting.
<10	<76	Inability to perform vigorous movement. Loss of consciousness. Convulsions. Death.

ANSI Z88.2-1992 requires air-supplying respirators for workers who enter an atmosphere having less than 16% oxygen at sea level. The ANSI standard assumes that nearly all workers will be able to escape from an atmosphere having 16% oxygen, even if it requires a moderate amount of exercise, such as climbing a ladder. When oxygen concentrations are less than 19.5% oxygen at sea level, ANSI Z88.2-1992 requires workers to use air-supplying respirators that have an emergency air supply for escape purposes. It assumes that some workers will be injured or debilitated by a 12.5% oxygen atmosphere, to the point at which they could not escape. ANSI's recommendations are intended to protect nearly all workers; and it assumes that workers are medically qualified and fit for duty. Workers are, on average, more fit than the general population.

To summarize, any reduction in oxygen concentrations will carry some risk to the population, because there will always be sensitive individuals. These probably include people with pulmonary or heart disease. On the basis of the references that were reviewed, it appears that minimal permanent injuries or deaths should occur in a physically fit and medically qualified population from a transient release of methane, if oxygen concentrations do not drop below 12.5% at sea level. If concentrations do not drop below 14% oxygen at sea level, the frequency of permanent injuries or deaths in the general population should be minimal as well. Of greater issue will be the potential for a fire from ignition of an LNG cloud.

3 CRYOGENIC SHIP DAMAGE: POTENTIAL AND IMPACTS

As noted in Appendix B, a range of LNG cargo tank breaches were calculated from the analysis of credible accidental and intentional breaching events. The size and location of potential breaches were used as a basis for the analysis of the potential for cryogenic damage to the structural steel of an LNG ship from a spill in the absence of a fire. Contact of steel with cryogenic fluids is known to cause embrittlement, which can significantly reduce the strength of steel [Vaudolon 2000]. A detailed structural analysis was beyond the scope of this review; but structural integrity embrittlement scoping analyses were conducted to assess the potential damage to an LNG ship from small and large LNG spills based on available fracture mechanics data and models. These analyses were guided by available information on LNG ship and tank designs, construction, and structural steel material property data [Linsner 2004] [Shell 2002] [Wellman 1983].

A review of the structural steel used in LNG ship fabrication shows extensive use of ABS-Class A, B, and C structural ship steel [Linsner 2004]. In discussions with the U.S. Coast Guard, ABS Class E and F structural steels are also being used in some newer LNG ships. Selected material properties for ABS Class B steel include [Wellman 1983] room temperature yield strength equal to 37×10^3 psi., coefficient of thermal expansion equal to 8.3×10^{-6} in/in °F, Young's modulus (E) equal to 30×10^6 psi. As with all low alloy carbon steels, A131 class B and C transition from ductile to brittle behavior with decreasing temperature. Lower shelf (brittle) behavior starts at about 32°F. For these steels, the fracture toughness (Kc) decreases approximately linearly from 90×10^3 psi√in at -60°F to 20×10^3psi√in at –260°F.

This is approximately the lower bound of fracture toughness for all low alloy carbon steels at LNG cryogenic temperatures, as shown in the table below. Fracture toughness is a major influence on the structural integrity of steels that come in contact with cryogenic fluids. The lower the fracture toughness, the higher potential for damage that could be expected. Because fracture toughness data at LNG-type temperatures for steel used in ship construction is limited, the use of correlations and extrapolations from available fracture toughness data can provide useful estimates of fracture toughness for many of these steels. Two approaches were used to estimate expected fracture toughness values at LNG cryogenic temperatures for ship steels.

One method of estimating fracture toughness makes use of the "Barsom-Rolfe" two-step correlation between Charpy V-Notch (CVN) data and fracture toughness [Barsom and Rolfe 1987]. ABS – E and ABS – F steels have CVN values of 14 ft-lbs and 17-20 ftlbs respectively. Using the Barsom-Rolfe two-step correlation, this equates to a 46 ksi√in fracture toughness value for ABS E and a 55 ksi√in value for ABS F steel. Data suggests that for low alloy carbon steels well into the lower shelf behavior, the slope of the fracture toughness versus temperature curve can be taken to be 1 ksi√in/°F, down to a lower bound of 20 ksi√in. Using this correlation, both of theses steels approach the lower bound Kc of 20 ksi√in at -260 °F. This is the same value of Kc for ABS Class B steels.

An alternate approach to estimation of fracture toughness can be appropriated from the nuclear pressure vessel industry [Barsom and Rolfe 1987]. Here, a reference curve (K_{IR}) has been constructed from an extensive database of fracture testing on low alloy carbon steels with

yield strength of less than 50 ksi. Fracture toughness as a function of temperature for steels typical of this class of materials is shown in Figure 12.

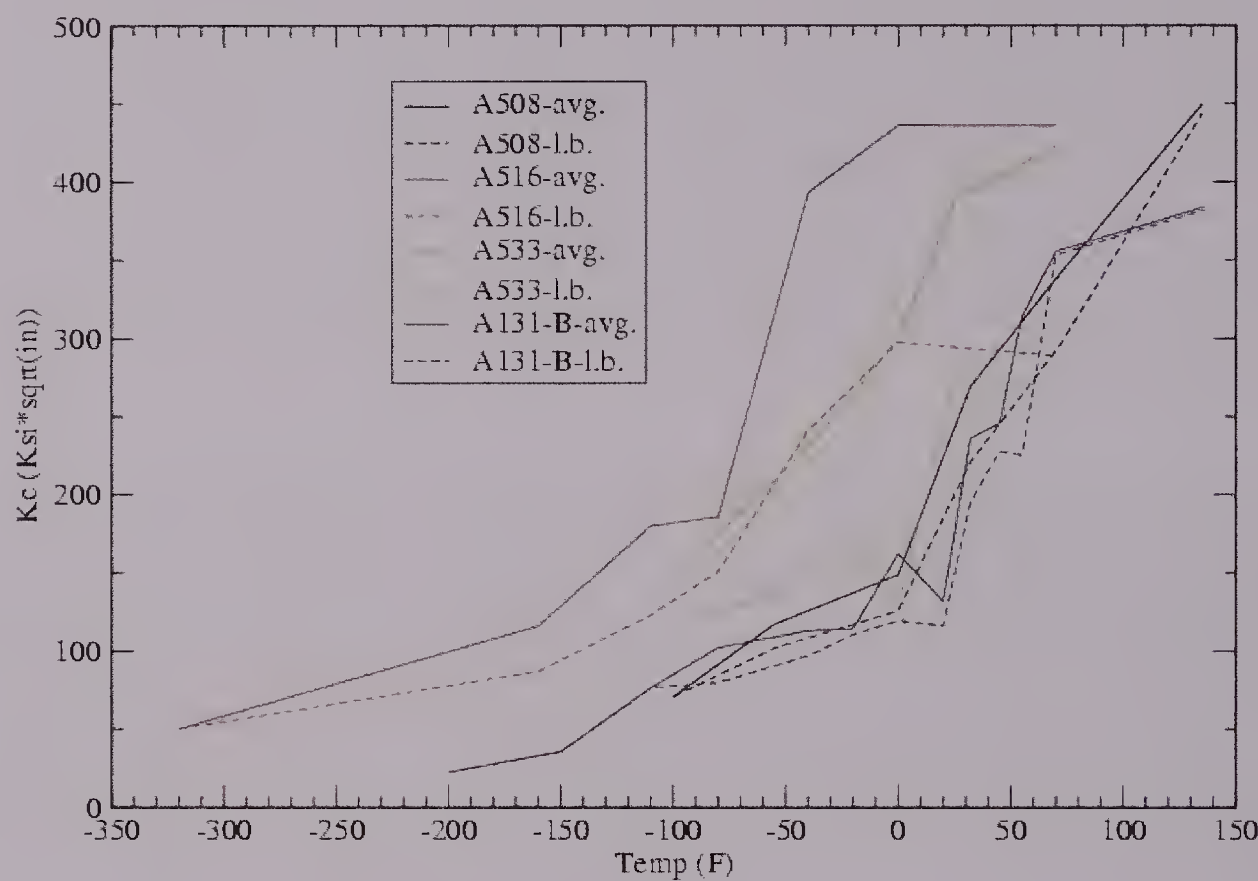


Figure 12. Fracture Toughness of Low Alloy Carbon Steels

This curve is represented by the following equation:

$$K_{IR} = 26.777 + 1.223e^{(0.0145[T-\{RT_{ndt}-160\}])}$$

The basis of this equation is that all the fracture toughness data can be represented by a single curve with a temperature shift. That is, reference nil-ductility temperature, RT_{ndt}, for the steel of interest is the key to using this K_{IR} curve. The nil-ductility temperature is determined through drop weight testing. Alternately, it can be determined by CVN testing. RT_{ndt} is 40 °F lower than the lowest temperature at which all CVN results have more than 40 mils lateral expansion. Unfortunately, neither of these data sets is available for ABS – E or ABS – F steels. In the absence of better data, a reasonable estimate for RT_{ndt} might be taken to be the temperature at which the steel has 15 ft-lbs of absorbed energy in a CVN test. For ABS – E, this is about - 40 °F. For ABS F, this is about –80 °F. Therefore, using the K_{IR} approach, the fracture toughness of ABS – E steel is estimated to be 27 ksi√in and ABS – F steel is 28 ksi√in. Note, in the K_{IR} equation above, the lower bound fracture toughness is taken to be 26.777 ksi√in rather than the 20 ksi√in assumed earlier. The fundamental conclusion is reinforced however. That is, at LNG cryogenic temperatures, all the ABS low alloy carbon ship hull steels are very near the lower bound fracture toughness for low alloy carbon steel.

Therefore, based on these two types of fracture toughness estimation techniques, regardless of steel type, all low alloy carbon steels approach this lower fracture toughness bound at

LNG cryogenic temperatures. This lower bound value was used to estimate potential thermal stress states in the ship structural steel for different types of breach and spill events.

Three cryogenic spill scenarios were computed for thermal stress, each of which can be related to a different type of breach event.

Scenario 1 (Small Spill)

The first scenario is a circular, through-thickness cold spot in a large, flat plate. This case could result from a spill of cryogenic material on one face of the plate while the other face is sensibly insulated (air or other lower heat transfer medium). The portion of the plate outside the cold spot provides constraint such that the region of the plate inside the cold spot is subjected to tensile stress to accommodate the thermal contraction due to the reduced temperature. The stress inside the cold spot can be computed from: [Goodier 1937]

$$\sigma = 0.5 \bullet \alpha \bullet \Delta T \bullet E$$

where σ = stress
α= coefficient of thermal expansion
ΔT= change in temperature
E= modulus of elasticity

Here, the resulting thermal stress is approximately $40x10^3$ psi or roughly equivalent to the yield strength.

Fracture can be determined by equating the fracture toughness (K_c) with the fracture driving force (stress intensity: K_I). Stress intensity can be calculated from [Barsom and Rolfe 1987]:

$K_I = \sigma\sqrt{\pi a}$, where 'a' is the flaw size and σ is the stress level.

Rearranging this equation, the critical flaw size can be computed as:

$$a_{cr} = \frac{K_c^2}{\pi\sigma^2}$$

The critical flaw size thus computed is about 0.1 inch. A crack-like defect of 0.1 inch would be rare in base metal plate material. However, in ship construction welding, such a flaw size could be relatively common. Once initiated, a flaw could be expected to propagate to the extent of the cold region and even some distance beyond. Thus, for a large penetration of a cryogenic LNG cargo tank and associated large spill, a large section of the ship structure could be fractured from the thermal insult alone, independent of other loadings (wave, blast, or shock).

Scenario 2 (Large, Internal Spill)

The second case considered is that of an entire structure at a low temperature supported by a structure of similar stiffness at a higher temperature. A penetration in the cryogenic LNG cargo tank, with the inner hull intact, could lead to the filling of the inner hull with the cryogenic liquid. If the ship is not ballasted, the space between the inner and outer hull

would be filled with air or nitrogen, essentially an insulator. Thus, the inner hull would be at the cryogenic temperature, while the outer hull is at sea temperature. The inner and outer hulls are of comparable stiffness. The equation for computing stress in this case is identical to that for the cold spot discussed above. The thermal stresses, fracture toughness, critical flaw size, etc. are nearly identical to the case of the cold spot. The conclusion here is that a flaw could propagate through the entire inner hull, either from side-to-side or axially, from front containment bulkhead to aft containment bulkhead of the compromised compartment.

Scenario 3 (Spill Between Ship Hulls)

Finally, the third case is for a plate, stiffened such that no out-of-plane displacement (bending) can occur. The top surface is maintained at a low temperature, while the bottom surface is maintained at a higher temperature (e.g., LNG spill within the inner and outer hulls). The temperature gradient across the plate is linear. This case could result from a penetration through both the inner hull and the cryogenic tank. Leaking LNG would encounter the inside of the outer hull plate, while seawater would be in contact with the outside of the outer hull plate. The cryogenic material and the sea can be approximated as constant temperature boundary conditions. Here, the thermal stress is given by [Goodier 1937]:

$$\sigma = \frac{\alpha \bullet \Delta T \bullet E}{(1-\upsilon)} \qquad \text{where '}\upsilon\text{' is Poisson's ratio}$$

This equation results in an elastically computed stress significantly in excess of the room temperature yield stress (100×10^3 psi). No attempt was made to include nonlinear material properties (plasticity). However, due to plastic deformation, the actual stresses resulting from this case will be significantly less than the elastically computed 100×10^3 psi., but still greater than the stresses resulting from the prior two cases. The potential for cracking is similar to the prior two cases.

For all three types of cryogenic spill events considered, the potential exists for progressive structural damage due to the thermal insult of the cryogenic liquid on the structural steel of the ship. The extent of the damage will depend on the volume and rate of LNG spilled and the ship areas that will be directly contacted by the liquid LNG. Based on the postulated breach events, attempts were made to estimate the potential level for ship damage from both accidental and intentional events. These are presented in the table below.

Table 40: Estimated LNG Ship Damage from Potential Tank Breaches & Spills

Breach Event	Breach Size	Tanks Breached	Ship Damage[b]
Accidental collision with small vessel	None	None	Minor[b]
Accidental collision with large vessel	5 – 12 m^2 (Spill area 0.5 – 1m^2)[a]	1	Moderate
Accidental Grounding	None	None	Minor
Intentional Breach	0.5 m^2	1	Minor
Intentional Breach	2 m^2	1	Minor
Intentional Breach	2 m^2	3	Moderate
Intentional Breach	12 m^2	1	Severe[d]
Intentional Breach	5 m^2	2	Severe
Intentional Spill	Premature offloading of LNG	None	Moderate-Severe

Notes: a - Assumes vessels remain joined during spill event and breach is mostly plugged
b - Minor suggests ship can be moved and unloaded safely
c – Moderate suggests damage that might impact vessel and cargo integrity
d – Severe suggests significant structural damage. Ship might not be able to be moved without significant difficulty and includes potential for cascading damage to other tanks

As discussed in Appendix B, the intentional breaching events considered included attacks, sabotage, hijackings, and insider threats. Each threat is a different type and would cause spills of different sizes and in different locations. This was taken into account when assessing what parts of an LNG ship would encounter spilled LNG and the extent and duration of the contact, discussed in detail in [Hightower 2004].

Table 40 shows that, for accidental and many intentional breaching events, the cryogenic damage to the LNG vessel would probably be minor to moderate. Moderate damage, however, might impact vessel and cargo integrity; therefore, pre-planning of approaches to mitigate these consequences should be considered. Severe structural damage could occur from some of the very large spills caused by intentional breaches. This is because the volume and rate of the LNG spilled could significantly impact the ship's structural steel. A cascading failure that involves damage to additional cryogenic tanks on the ship from the initial damage of one of the LNG cargo tanks is a possibility that cannot be ruled out at the present time. Determination of the probability or likelihood of such an event depends on the breach scenario, the spill location and any implementation of prevention and mitigation strategies to prevent such an event. In areas where cascading failures might be a significant issue, the use of complex, coupled, thermal, fluid, and structural analyses should be employed to accurately determine the potential for and extent of structural damage to the LNG ship and other LNG cargo tanks from various breach and spill events.

4 LNG SPILL DISPERSION AND THERMAL HAZARDS

If ignition occurs immediately upon spillage, then non-pre-mixed combustion occurs. In industrial spills, non-pre-mixed combustion is referred to as a fire, and the fuel-air mixing rate is controlled by flow turbulence. (In laboratory settings, non-pre-mixed combustion is referred to as a diffusion flame, because mixing is controlled by diffusive processes.) Specifically for LNG spills, the fire would be referred to as a 'spill' or 'pool' fire, as the liquid spilling from the ship results in a quasi-steady-state fire. The hazard from this type of combustion is thermal, primarily driven by radiating heat flux. Other types of non-pre-mixed combustion, including jet and spray flames, are not relevant to LNG spills, due to LNG's low storage pressure and low boiling point.

If mixing occurs before ignition, then the resulting combustion is pre-mixed. In industrial accident settings, two forms of pre-mixed combustion can occur, depending upon the strength of the ignition source and geometric factors. The two forms are termed *deflagration* and *detonation*. Deflagration is the most likely mode to occur. Because the fuel is pre-mixed with air, the flames spread at a rate relative to the chemical mixture (flame speed) and the rate at which turbulent mixing can enhance the flame area. Deflagrations differ in their consequences, depending on whether they occur in confined or unconfined volumes.

In large open areas, the hot combustion products are buoyant and will entrain the air into the fuel mixture. The result is known as a fireball. In enclosed volumes, the combustion will result in pressure generation due to confinement of the volume expansion of the hot gases. The result is usually the failure of the enclosure. These events are loosely termed explosions. Propane leaks in houses are a typical example.

If ignition occurs sometime during mixing, not before mixing takes place and not at the end when the fuel is completely mixed, then a mixture of combustion modes will result. Generally, a pre-mixed combustion event will occur first, followed by a non-pre-mixed combustion event; and pre-mixed combustion occurs faster than most mixing events. Thus, upon ignition, a pre-mixed flame will propagate from the ignition source to the spill location. This phenomenon is known as a flashback. It can generate high pressures or result in a slow burn or fireball. The flame will anchor on the spill source and a fire will result at the spill source for the duration of the spill.

The distance and thermal damage to structures from a range of different spills was calculated based on the following selection of nominal spill conditions.

Condition 1: Spill Calculations Drainage From A Non-Pressurized Tank With A Single Hole

Note that, for all calculations, a tank with volume of 25,000 m^3 could be expected to spill approximately 12,500 m^3. An initial liquid height in the tank above the breach of 15 m and a density of 450 kg/m^3 for LNG were used.

Nomenclature:

A_t – Cross sectional area of tank
A_o - Cross sectional area of hole
m – mass of liquid in tank
v – velocity
v_o – effective velocity out of hole
h_t – height of the top surface of the liquid
h_i – initial height of fluid
C_d – discharge coefficient
V – volume of liquid

Basic Equations:
First apply continuity equation where:

$$\frac{dm}{dt} = (\rho A v)_{in} - (\rho A v)_{out}$$

$$(\rho A v)_{in} = 0, \;\; thus$$

$$\frac{dm}{dt} = -(\rho A v)_{out} \qquad (1)$$

Mass, m, can be expressed as ρV, and then V = A_th. Substitute into eq. (1):

$$\frac{d(\rho A_t h)}{dt} = -(\rho A v)_{out} \qquad (2)$$

The velocity of the fluid coming out of the tank can be expressed as a function of height through invoking Bernoulli's equation.

$$\frac{1}{2}\rho v_t^2 + p_t + \rho g h_t = \frac{1}{2}\rho v_o^2 + p_o + \rho g h_o$$

$$\rho g h_t = \frac{1}{2}\rho v_o^2$$

$$v_o = \sqrt{2 g h_t}$$

Multiply by a discharge coefficient to account for resistance of the hole:

$$v_o = C_d \sqrt{2 g h_t} \qquad (3)$$

Total time of discharge:

Substitute eq. (3) into eq. (2) and integrate with initial condition, t = 0, h=h_i.

$t = \sqrt{\frac{2}{g}} \frac{A_t}{C_d A_o} \left(\sqrt{h_i} - \sqrt{h} \right)$, then the height of liquid throughout time can be determined.

Total time to drain is:

$$t = \sqrt{\frac{2}{g}} \frac{A_t}{C_d A_o} \left(\sqrt{h_i} \right)$$

Average flow rate:

The flow rate will be greatest at the beginning of the spill, due to the hydrostatic head having a maximum. The flow rate has a linear dependence on time, so an average flow rate was determined by dividing the maximum flow rate by 2. The maximum flow rate can be found by substituting eq. (3) into eq. (1), and using m= ρV to express in terms of volume/time. Then,

$$\left(\frac{dV}{dt} \right)_{average} = \frac{-(Av)_{out}}{2} = -\frac{C_d A_o}{2} \sqrt{2gh_i} \qquad (4)$$

Equation 4 was used for the calculations to determine the average flow rate out of the tank.

Condition 2: Spreading Equation

The diameter of the spill was determined by assuming a steady state where the mass coming in is balanced by the mass going out, due to the heat flux from the heating of the water below and from the fire above, denoted by v_{total}. Thus,

$$(\rho A v)_{in} = (\rho A v)_{out}$$

$$\left(\frac{dV}{dt} \right)_{average} = (Av)_{out} = \frac{\pi D^2}{4} v_{total}$$

$$D = \sqrt{\frac{4}{\pi v_{total}} \left(\frac{dV}{dt} \right)_{average}} \qquad (5)$$

Equation (5) was used to determine the diameter of the spill.

Condition 3: Distance To A Specified Radiative Flux Level after Fire Ignition

Nomenclature:

q'' - radiative flux incident upon an object
E_p – Average surface emissive power (kW/m^2)
F – view factor
τ - transmissivity

A right cylinder, solid flame model was used to model the pool fire. The effect of wind on the flame was considered negligible.

The Moorehouse correlation for LNG was used to calculate flame height, found on page 3-204 of the SFPE handbook, Fire Protection Engineering, 2nd ed., (1995). The term u^* is a non-dimensional wind velocity taken to be 1 for low wind speeds.

$$H = 6.2\,D\left[\dot{m}'' / \rho_a \sqrt{gD}\right]^{0.254} u^{*\,-0.044} \qquad (6)$$

The radiative flux incident upon an object can be determined by:

$$q'' = E_p \tau F \qquad (7)$$

In order to determine distance to a specified, q'', Fig. 3-11.13 on page 3-210 of the SFPE handbook was used. The figure gives the non-dimensional distance from the flame axis as a function of view factor and fire height-to-radius ratio. Because q'', E_p, and τ are specified, F can be determined by eq. (7), and height-to-radius ratio from eq. (6). Then the thermal hazard distance can be determined from the figure.

Using the nominal conditions, an analysis was performed that looked at the potential ranges of spill and fire conditions available from experimental literature. Example results of this sensitivity analysis are presented in the table below.

Table 41: Sensitivity Analysis of Thermal Intensity Level Distances

HOLE SIZE (m^2)	TANKS BREACHED	DISCHARGE COEFFICIENT	BURN RATE (m/s)	SURFACE EMISSIVE POWER (kW/m^2)	POOL DIAMETER (m)	BURN TIME (min)	DISTANCE TO 37.5 kW/m^2 (m)	DISTANCE TO 5 kW/m^2 (m
ACCIDENTAL EVENTS								
1	1	.6	$3X10^{-4}$	220	148	40	177	554
2	1	.6	$3X10^{-4}$	220	209	20	250	784
INTENTIONAL EVENTS								
2	3	.6	3×10^{-4}	220	209	20	250	784
5	3	.6	3×10^{-4}	220	572	8.1	630	2118
5*	1	.6	3×10^{-4}	220	330	8.1	391	1305
5	1	.9	3×10^{-4}	220	405	5.4	478	1579
5	1	.6	2×10^{-4}	220	395	8.1	454	1538
5	1	.6	3×10^{-4}	350	330	8.1	529	1652
10	1	.6	3×10^{-4}	220	467	4.1	549	1823

*nominal case

The results in Table 41 suggest that, for most of the credible accidental breach and spill scenarios, the general distance for major structural damage (high hazards where the thermal intensity is about 37.5 kW/m^2) can occur, on average, up to 250 m from a spill. The results also suggest that, for most of the credible intentional breach and spill scenarios, the general

distance for major structural damage (high hazards) can occur, on average, up to 500 m from a spill. In general, the distance to low thermal hazard levels, about 5 kW/m^2 is about 600-750 m for accidental spills and approximately 1600 m for intentional spills. For a very large, cascading spill, high hazard zones could approach 2000 m. These results were used to help quantify the hazard zone identification and hazard level identification for various breach and spill events.

Consideration of Mass Fires and Pool Fires

All of the LNG fire studies reviewed assume that a single, coherent pool fire can be maintained for very large pool diameters (>100m). This might be unlikely due to the inability of air to get into the interior of the fire and support combustion. At some very large size, the flame envelope would break up into multiple flamelets. The heights of these flamelets are much less than the fuel bed diameter [Zukoski, Corlett, Cox and Chitty]. The break up into flamelets would result in a much shorter flame height than that assumed by the reviewed studies, which are applying height correlations far out of the diameter range for which they were developed. It is expected that the L/D (height/pool diameter) would probably be much smaller than that predicted by existing correlations.

The correlations predict an L/D ratio between one and two, while a more realistic ratio for a mass fire would be under 0.5. The view factor is very sensitive to flame height at distances not close to the fire (>1 pool diameter). View factors are used to determine how much radiative flux an object receives. Thus, if a more realistic flame height is used, lower than that which is typically calculated, then the amount of heat flux that an object receives would be less, thereby decreasing the thermal hazard zone. The zone could be decreased by a factor of two to three, depending upon the damaging heat flux levels of interest.

Various correlations for flame height have been developed for a range of pool diameters up to 30 m. The L/D correlations are typically expressed in terms of a non-dimensional heat release rate: $\dot{Q}^*$. The following figure is from Zukoski, which shows how the ratio of flame height to pool diameter varies with $\dot{Q}^*$. As pool diameter increases, $\dot{Q}^*$ decreases because it is proportional to $1/\sqrt{D}$. Zukoski states that there are different transition regions that occur, demarked by I – V in Figure 13.

For very large pool fires, region II, the flame breaks up into a number of independent flamelets as $\dot{Q}^*$ decreases, and the flame height depends on the diameter and the heat release rate. For region I, the height of the flamelets appears to become roughly independent of the source-diameter and depends only on the local heat release rate per unit area (or fuel flow per unit area). This figure is based upon pool fire tests where fuel vaporization is not affected by a substrate (such as water); water; therefore, this curve should not be used for the determination of when a pool breaks up into flamelets for LNG pool fires on water. It is unknown what the limiting diameter for break up is for LNG pool fires on water. Using an estimate of approximately 100 m, the distance to the high and lower level hazards was calculated for a range of spill conditions and is presented in Table 46.

The pool diameter and flame height suggested are speculative because experiments for large pool fires have yet to be performed. Many researchers have provided flame height correlations based on pool fires much smaller than those presently being considered [Heskestad 1998]. These results suggest LNG pool fires of as much as 8900 m in diameter before

breakup, based on results of laboratory testing on approximately 7 m by 7m wood fiberboards. Whether their results can be extrapolated to very large pool fires remains to be determined.

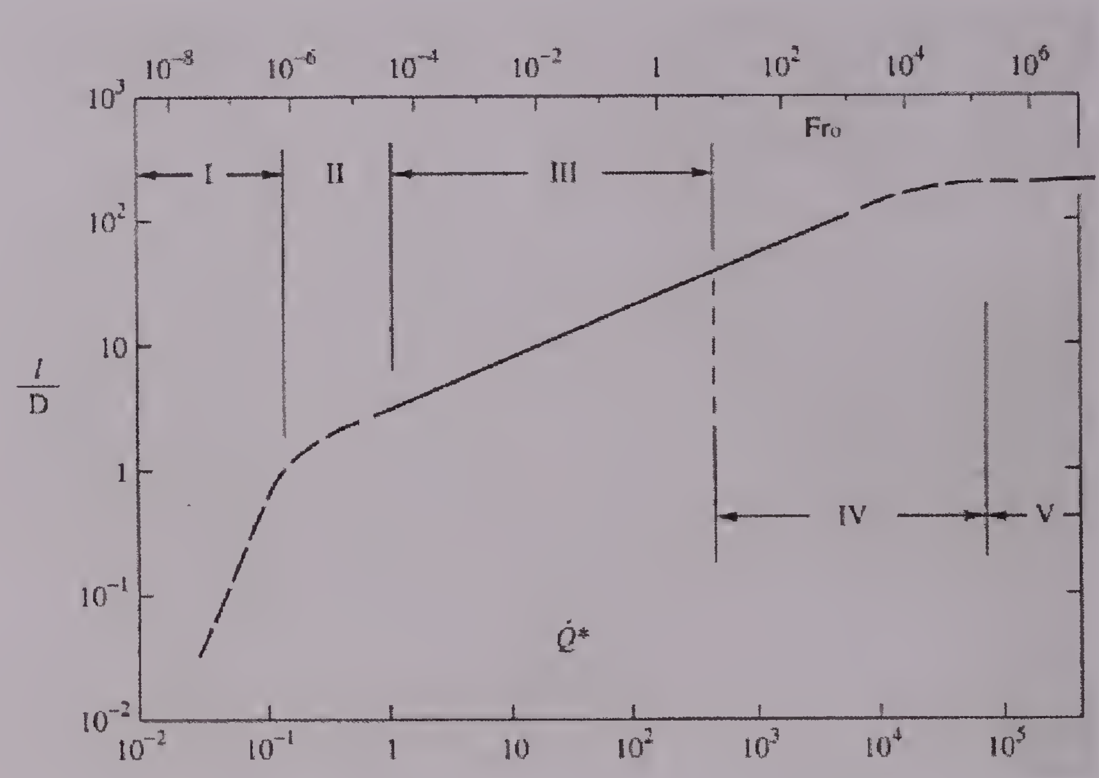


Figure 13. Flame Height/Diameter Ratio vs. Dimensionless Heat Release Rate

Taken from: [Zukoski, 1995]

The following calculations in Table 42 show the differences in the thermal hazard distances obtained using an assumption of a single, coherent pool fire for very large diameters versus the assumption of several mass fires (flamelets) with maximum diameters on the order of 100 m. A solid flame model that accounts for view factors and transmissivity and the Moorhouse correlation for flame height to diameter was used. A low wind condition was assumed; therefore, flame tilt and drag were not required. A surface emissive power of 220 kW/m^2, a transmissivity value of 0.8, and a burn rate of 3 x 10^{-4} were used. The results indicate that there is a significant increase in the distance to 5 kW/m^2 when a single coherent pool fire is assumed. The thermal hazard distances from a mass fire (flamelets), which is physically more realistic for large spills, should be considered in evaluating thermal hazards from potential large spills.

Table 42: Thermal Hazard Distance - Single Pool Fire vs. Mass Fire Assumptions

ASSUMPTION	DIAMETER	FLAME HEIGHT (m)	DISTANCE TO 37.5 kW/m^2 (m)	DISTANCE TO 5 kW/m^2 (m)
Mass Fire (flamelets)	100 m each (multiple fires comprising area of 500 m dia.)	148	400	1000
Single Pool Fire	500 m	604	575	1800

Furthermore, studies discussed in Appendix C note that the missive power decreases with increasing fire size due to smoke shielding. Values significantly lower than 220KW/m^2 are possible. As improved data are collected, improvements in hazard analysis can be

implemented. Other phenomena, such as the occurrence of fire whirls, may increase the hazard by generating large columnar flames with high emissive power. These structures most often form during non circular pool shapes exposed to light winds and rarely last more than a few seconds.

LNG Dispersion

In most of the scenarios identified, the thermal hazards from a spill are expected to manifest as a pool fire, based on the high probability that an ignition source will be available from most of the events identified. In some instances, such as an intentional spill without a tank breach, an immediate ignition source might not be available and the spilled LNG could, therefore, disperse as a vapor cloud. For large spills, the vapor cloud could extend to as much as 1600 m or more, depending on spill location and site atmospheric conditions. In congested or highly populated areas, an ignition source would be likely, as opposed to remote areas, in which an ignition source might be less likely.

If ignited close to the spill, the thermal loading from the vapor cloud ignition might not be significantly different from a pool fire, because the ignited vapor cloud would probably burn back to the source of liquid LNG and transition into a pool fire. If the cloud is ignited at a significant distance from the spill, the thermal hazard zones can be extended significantly. The thermal radiation from the ignition of a vapor cloud can be very high within the ignited cloud and, therefore, particularly hazardous to people.

Experimental data and analytical estimates for vapor spreading suggest that a large vapor plume could extend to large distances, depending on atmospheric conditions. Therefore, while the impact from a vapor cloud dispersion and ignition from a large spill can potentially extend beyond 1600 meters, the area of high impact might be reduced. This suggests that LNG vapor dispersion analysis should be conducted using site-specific atmospheric conditions, location topography, and ship operations to adequately assess the potential areas and levels of hazards to public safety and property, and consideration of risk mitigation measures, such as development of approaches and procedures to ignite a dispersion cloud quickly if conditions exist that the cloud would impact critical areas.

To assess the extent of the potential dispersion from an LNG spill, we used VULCAN, a validated CFD model [Tieszen, et al. 1996]. The VULCAN fire field model under development at Sandia National Laboratories was derived from the KAMELEON Fire model in collaboration with SINTEF and Computational Industry Technologies, AS (Norway). VULCAN was developed for liquid and gaseous hydrocarbon fuels. The model has been used for a large number of heavy hydrocarbon fuel fires. VULCAN uses a Cartesian based geometry. The code runs on single or multi-processor machines. It generally parallelizes best on six processors. It runs under LINUX and UNIX operating systems.

VULCAN is a validated CFD fire model that uses a standard RANS formulation of the equations of motion, where the turbulence is averaged across all time scales using a k-ε turbulence model. A buoyant, vorticity generation sub-model of turbulence is included for turbulence length scales below the scale of the grid. VULCAN uses Magnussen's Eddy Dissipation Concept combustion model to relate mechanistically the local fuel, oxygen, energy, and turbulence levels to consumption of species. Soot is modeled using Magnussen's soot model to describe mechanistically the soot formation and destruction process.

VULCAN uses Leckner's model for gas band radiation. The transport of thermal radiation is calculated using the Discrete Transfer Method of Shah to solve the radiative transport equation.

Either the evaporation of a liquid pool is modeled using a user-specified evaporation rate, or by allowing the code to calculate its own evaporation rate based on heat transfer into the fuel pool. VULCAN also has a rudimentary liquid spreading model based on lubrication theory. This model predicts spreading of fuel on a horizontal surface, and is capable of modeling the dripping/draining of fuel vertically (e.g., from floor to floor in a building).

In order to obtain LNG dispersion distances to LFL for accidental events, a low wind speed and highly stable atmospheric condition were chosen because this has shown to result in the greatest distances to LFL from experiment, and thus should be the most conservative. A wind speed of 2.33 m/s at 10 m above ground and an F stability class were used for these simulations. The time it took for LFL to be reached was approximately 20 min. for each calculation. Two cases were analyzed, one for the nominal case of a 5 m^2 hole and one tank breach, and the other for a 5 m^2 hole and three tanks breached <u>at once</u>. This last case is the largest expected spill; hence, it should give an upper bound of the LFL for vapor dispersion for intentional events. The results are summarized in the table below.

Table 43: Dispersion Distances to LFL for Potential Spills

HOLE SIZE (m^2)	TANKS BREACHED	POOL DIAMETER (m)	SPILL DURATION (min)	DISTANCE TO LFL (m)
Accidental Events				
1	1	148	40	1536
2	1	209	20	1710
Intentional Events				
5	1	330	8.1	2450
5	3	572	8.1	3614

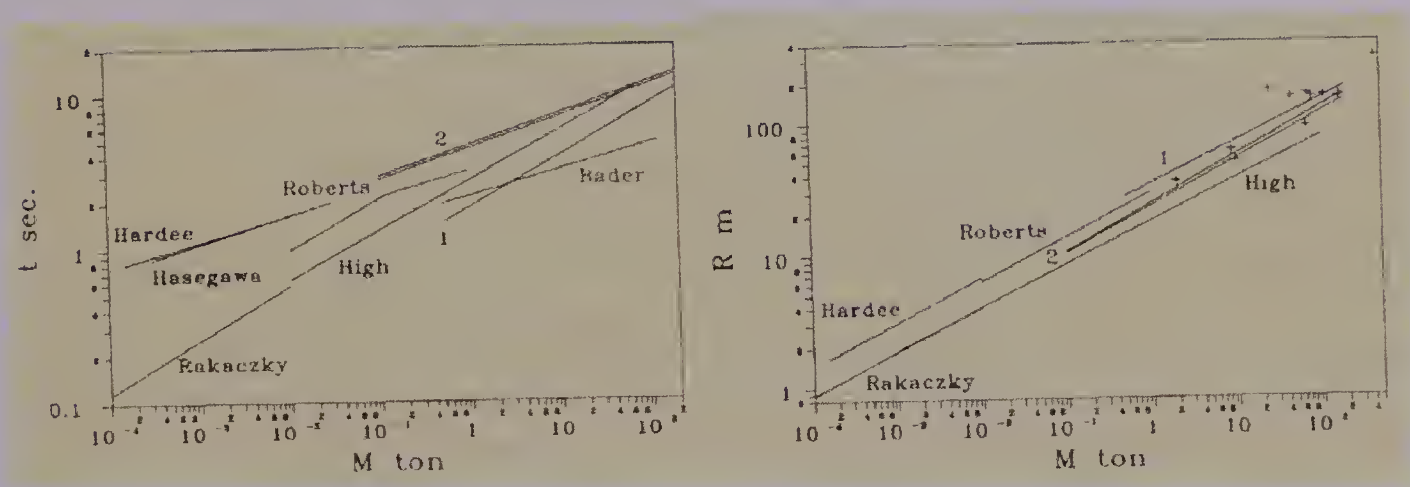
As noted above, the chances of a large vapor dispersion from either an accidental or intentional breach is rather unlikely because of the high probability that an ignition source will be available for most of the events identified. Although, the significant distances though of potential vapor dispersion, especially for a large intentional breach, suggest that LNG vapor dispersion analysis and risk mitigation measures should be carefully considered. Location-specific environmental conditions should be carefully evaluated and appropriate safety measures implemented to ensure that public health and safety, and critical facilities and infrastructures, are adequately protected.

4.1 Fireballs Resulting from an LNG Spill

A fireball will result from an LNG spill only if some mixing of the fuel and air occurs prior to ignition. Thus, if ignition occurs immediately upon release, no fireball will result. For a fireball to occur there must be fuel release, spread, vaporization, and ignition after significant premixing. If all these events have occurred, a fireball is the most benign form of

combustion that can result. The hazards are principally short-time thermal damage high in the air and away from structures and people.

Large-scale fuel-air fireballs and explosions were studied in Russia in the late 1980's [Dorofeev et al. 1991]. In their study, fireballs were created from the dispersal of 0.1 to 100 metric tons of hydrocarbon fuels (gasoline, kerosene, and diesel fuel). Because the fuels used in the experiments have significantly lower vapor pressure than LNG, mixing was created by explosively dispersing and igniting the mixture in a fuel-rich state. In spite of these differences, the results are directly relevant to fireballs that might result from a delayed ignition of vaporized LNG.



(a) (b)

Figure 14. Fireball Duration and Radius as a Function of Fuel Mass

[Dorefeev et. al. 1991]

Figure 14 shows the duration (in seconds) of combustion within the rising fireball and the maximum radius (in meters) of the fireball as a function of the fuel mass (in metric tons; i.e., per 1000kg). For example, a fireball from a 100-ton fuel release is about 11 seconds duration and has a radius of about 115 meters. Also shown in Figure 13 are the results of earlier studies, providing a measure of the uncertainty in the available data. Dorofeev fit the data to a curve and provided the following correlations:

The duration of the fireball from combusting clouds is given as

$$t = 4.6M^{0.2}$$

in which the fuel mass, M, is in metric tons and the time, t, is given in seconds.

Similarly, the maximum radius of the fireball is given as:

$$R = 23M^{0.35}$$

in which the fuel mass, M, is in metric tons and the radius, R, is given in meters.

The thermal flux from the fireballs was also measured. Peak fluxes for combusting gasoline were in the 150 – 330 kW/m^2 range. LNG would be expected to have similar behavior.

These flux levels are of the same order of magnitude as those from a pool fire. Unlike a pool fire, however, the fireball is of short duration (in the order of seconds to tens of seconds), depending upon the mass of fuel in the air. The fireball will entrain and burn all flammable vapors and provide an ignition source to the underlying liquid spill. The overall threat from a fireball is typically not of primary concern if a long duration pool fire follows it.

4.2 Thermal Damage on Structures

The potential for damage to other vessels or structures from an LNG spill and fire needs to be considered to determine the overall risk. As noted in Appendix C, the potential for fire damage from spills can be relatively extensive. The six spills projected in Appendix B would take anywhere from 10 – 20 minutes to release up to 50% of the LNG in an individual tank for a large spill and up to one hour for a small spill, depending on the location.

The thermal radiation that will damage structures is approximately 37 kW/m^2 for durations of more than 10 minutes. Damage can be expected to the vessel and nearby steel structures, because steel strengths are reduced to 60 – 75% of their room temperature values at 800º K. Further reduction in strength will result for temperatures above 800º K. Steel will melt at approximately 1800º K and is generally considered to have no strength at half the melt temperature, or 900º K. The calculations suggest that these temperatures could exist at a spill from an LNG cargo tank from 30 minutes to an hour and, therefore, potentially damage nearby steel and other structures.

Of even greater importance is the possibility that a large spill could cause a cascading set of LNG cargo tank failures. In this instance, significant long-term fire damage could result to a nearby steel structure, unloading terminal, or unloading platform. Positive operational and risk management measures can be taken to try to prevent these types of issues. This could include redundant or multiple offloading capabilities or moorings, fire protection systems, etc., as identified in Section 6.

4.3 Analysis of Fire Damage to LNG Cargo Tank Insulation

The insulation used in LNG ships varies considerably, from rigid foams to bulk zeolite-type materials. The susceptibility of these insulation materials to either burning or thermal degradation also varies considerably. Many LNG vessels use foam insulation materials that include polystyrene, polyurethane, phenolic resin, and hybrid foam systems. [Kawasaki 2003] [Kvaerner-Masa 2003,2004] [OTA 1977] These foams are considered combustible to slightly combustible; meaning, they will burn when exposed to an open flame, as might occur in a breach with a resulting fire. Of greater importance, though, is that these foams will begin to decompose at temperatures of about 550º K. Because an LNG fire can be expected to burn at temperatures of approximately 3000°F, thermal loading on the LNG vessel from an engulfing fire, if suffieient in duration, could lead to heat transfer through the structure, decomposition of the foam, and an increase in the LNG volatilization rate in an impacted cargo tank. This could lead to rupture or collapse of the tank, additional damage to the LNG vessel, and greater hazards to both the public and property.

Foam used to insulate LNG is enclosed within a steel weather cover, or within the inner hull of the LNG tanker. Extensive burning of the foam is not expected, given the lack of sufficient air to support combustion in these regions, even in cases with limited damage to the

hull or weather cover. Based on the foam being located within an enclosure, thermal decomposition of the LNG foam insulation is more likely. Heat transfer will result in thermal decomposition of the foam insulation, the products of which will burn if vented to the air, or cause an increase in the pressure in the region between the steel and the inner container.

From the spills calculated and discussed in this section, accidental spills with general pool fire diameters of 200 m might be possible. The flame height for such a spill might approach 150 m, high enough to engulf the top of an LNG tanker. For this size of fire, at least some portions of adjacent LNG cargo tanks would probably be exposed to the fire. As calculated in other sections of the report, a fire from a spill could last from five to twenty minutes.

We estimated the consequence of a fire from an LNG spill on the insulation of an undamaged LNG cargo tank. Initial modeling of the thermal response and decomposition of 12 lb per cubic foot density polyurethane foam in above-deck areas was conducted using one-dimensional heat transfer models and polyurethane foam thermal degradation data. The above deck location was chosen as a severe condition, due to the presence of only a single, steel cover and air gap protecting the foam insulation. The calculations were conducted with a tank configuration of a steel cover and air gap overlaying eight inches of foam insulation over an aluminum LNG cargo tank. Using a thermal radiation intensity of 220 kW/m^2 for the fire, as observed from several LNG fire tests, the analysis suggests that heat transfer through the steel shell and air gap could fully degrade eight inches of polyurethane type foam in about five minutes. The maximum volumetric production of LNG vapor calculated in the LNG cargo tank was about 0.8 m^3/s per square meter of tank wall exposed to the fire.

For several reasons, the analysis probably provides a lower bound for the time required for a fire from an LNG spill to degrade the thermal insulation of an adjacent cargo container. First, the analysis did not take into consideration the thermal retardation benefits of the fire suppression systems on LNG cargo tankers, which can provide up to 10 $liters/m^2$ per minute of water to exposed cargo tanks and decks, as established by the International Gas Carrier Code. Second, many LNG carrier designs have up to 36 inches of thermal insulation, which probably increases the time for damage to occur to an adjacent LNG cargo tank. Third, the thermal decomposition rate and decomposition temperature of insulating foams differ, depending on the foam material and properties. These additional factors all could increase the time required for full thermal degradation of the insulating foam on an adjacent LNG cargo tank.

The results, though, do suggest that damage to adjacent containers from an LNG spill and fire cannot be ruled out and should be carefully considered, especially in operations in high-consequence areas. Based on our analysis, it appears that one to two adjacent LNG cargo tanks might be affected at any one time from an LNG spill and fire. Efforts to manage the hazards from the impact of an LNG fire on adjacent cargo tanks should consider a combination of risk management approaches. These should include consideration of LNG cargo vessel designs, consideration of the designs of LNG cargo tank insulation and thermal degradation properties, consideration of operations and safety management improvements or upgrades, and consideration of both public safety and property consequences for site-specific locations. These efforts, when implemented as a system, could produce an integrated protection and risk management approach that provides an appropriate level of both public safety and property and reduces potential damages from a fire.

5 LNG – AIR COMBUSTION TO GENERATE DAMAGING PRESSURE

Two types of combustion modes might produce damaging pressure, deflagration, and detonation. Deflagration is a rapid combustion that progresses through unburned fuel-air mixture at subsonic velocities, whereas detonation is an extremely rapid combustion that progresses through an unburned fuel-air mixture at supersonic velocities.

In order for deflagration to occur, the fuel-air concentration must be above the minimum flammable limit (lean limit) and below the maximum flammable limit (rich limit). For LNG, these limits are 3.8% – 17% fuel by volume. If the fuel concentration is within these limits and encounters an ignition source, it will ignite and burn. Because of the moderate flammability range, the amount of time lapse between dispersal and ignition is limited. For low reactivity fuels such as natural gas, combustion will usually progress at low velocities and not generate overpressure. Certain conditions, however, might cause an increase in burn rate that does result in overpressure. If the fuel-air cloud is confined, is very turbulent, or progresses through obstacles, a rapid acceleration in burn rate might occur [Benedick et al. 1987]. In extreme cases, the burn rate might increase to supersonic velocities. This is known as deflagration-to-detonation transition (DDT).

Under specialized conditions, pre-mixed combustion can result in a detonation. This mode is not common and is generally considered to be very unlikely (but not impossible) to occur in most industrial accident situations, such as an LNG spill. Detonations have the highest power density of any combustion mode and, thus, result in the highest pressures and most damage. In a detonation, the combustion front typically travels at Mach 5 and, for hydrocarbons, has a peak pressure about 15 times the initial pressure. A detonation can be directly initiated in a fuel and air mixture from high initiation pressures or, under very limited circumstances, it can transition from a deflagration to a detonation (called DDT, or deflagration to detonation transition in the pre-mixed combustion literature) under conditions involving confinement. In industrial accidents, detonations are also sometimes called 'unconfined vapor cloud explosions.' In military literature, gas phase detonations are termed fuel-air explosions (FAE).

Detonation is the most violent form of fuel-air combustion. For detonation to occur, the fuel-air mixture must be within the minimum and maximum detonation limits. These limits are much narrower than flammability limits. To ignite a fuel-air mixture within the limits of detonation, shock initiation is necessary. Shock initiation can be produced by "igniting" the fuel-air cloud with an explosion or by the deflagration-to-detonation transition involving confinement described above.

For low reactivity fuels, the initiation energies are quite large and unlikely to occur in an accidental breach, but might be possible in an intentional breach or tank rupture scenario. Spilled LNG could become trapped between the inner and outer hulls which, if ignited, could lead to an explosion. In general, large releases will involve sufficient LNG for this space to be fuel rich. Of greater concern are small leaks where a flammable mixture could develop.

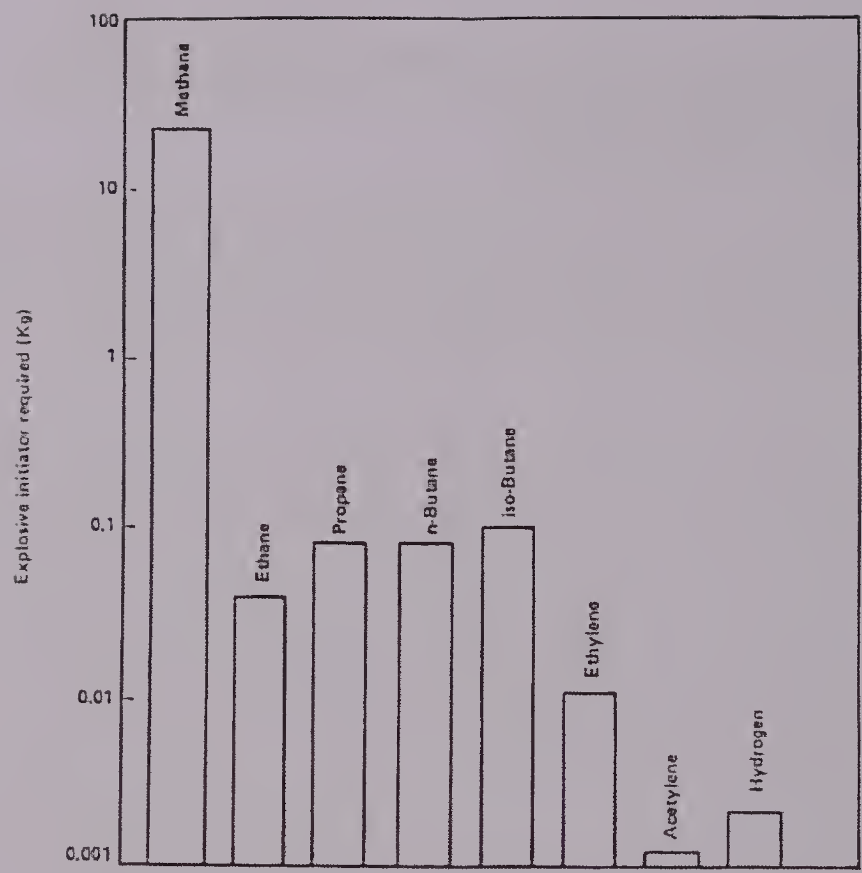


Figure 15. Relative Detonation Properties of Common Fuels

[Benedick et al 1986]

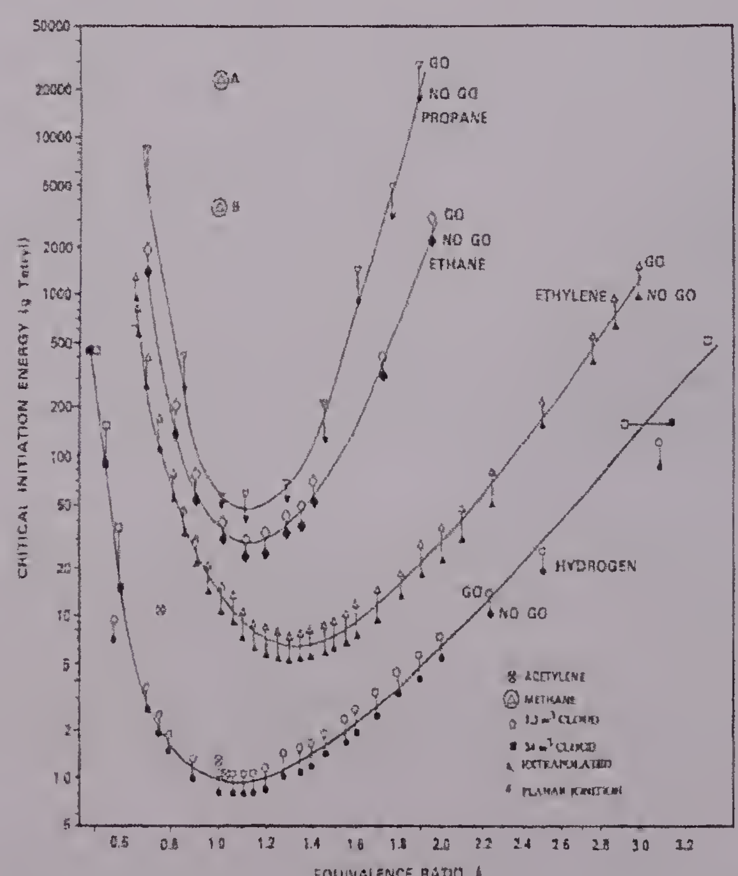


Figure 16. Initiation Energy Required to Detonate Common Fuels at Various Fuel-Air Ratios.

[Moen 1993]

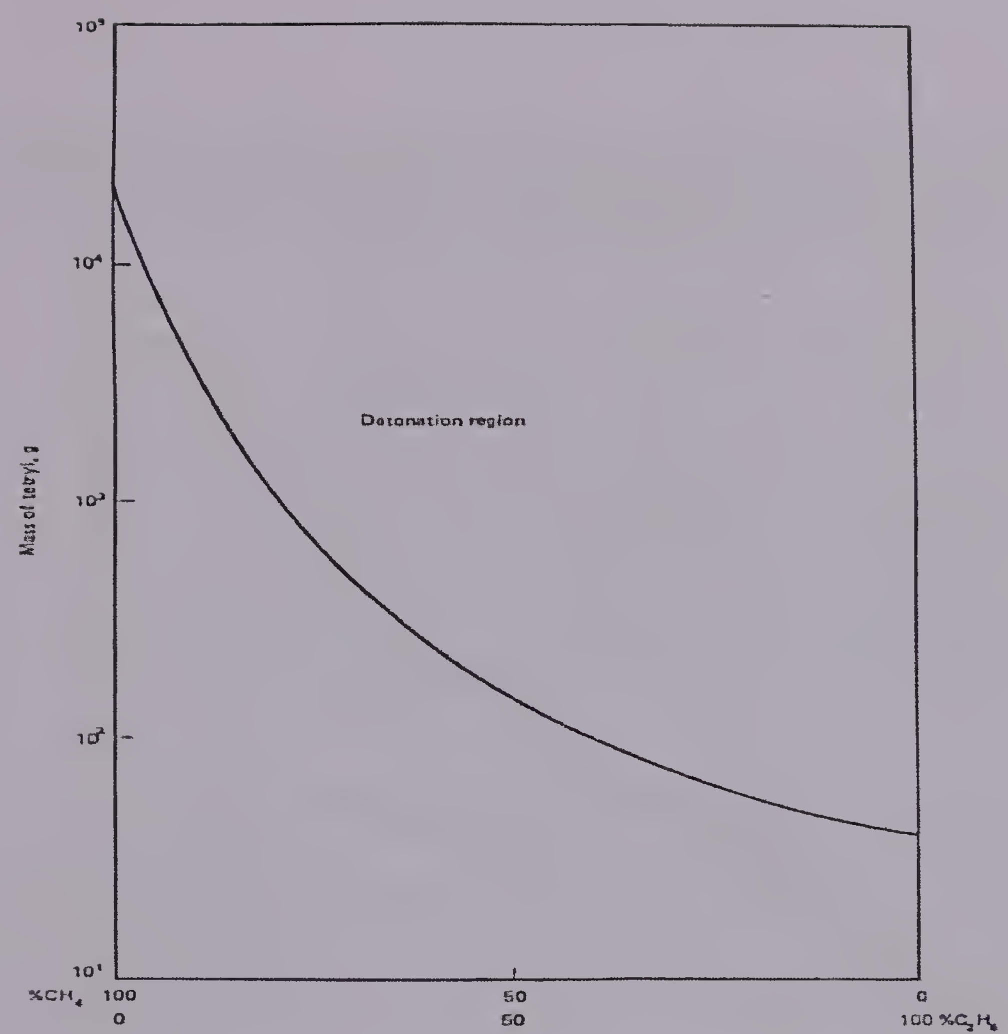


Figure 17. Effect of Ethane Concentration on the Detonability of Methane

[Moen 1993]

Another potential for an explosion is if LNG is spilled without an ignition source, such as an intentional spill from premature offloading of LNG. In this scenario, there could be extensive volumes of LNG that can be spilled either onto the ship or onto the water surface without and ignition source. These type of approaches have been considered and used and are very sensitive to environmental and meteorological conditions [Tieszen 1991]. Therefore, the potential for this type of event exists, but actually getting an explosion can be difficult.

Figures 16 – 17 show the relative detonation properties of several common fuels; and Table 44 provides some physical and chemical properties of hydrocarbon fuels. As Figure 15 shows, methane does not detonate as readily as other hydrocarbons, making it a safer fuel. Further, all fuels become less able to detonate if they are not perfectly mixed to stoichiometric proportions, as shown in Figure 16. It is unlikely for this correct stoichiometric proportion to be obtained around or in a ship during a cryogenic liquid spill. For many sources, refined LNG has a high percentage of methane at the wellhead compared to natural gas. Figure 17 shows that the level of refinement of natural gas stored as LNG can have an effect on detonation sensitivity, with a less processed product being more sensitive to detonation.

Table 44: Properties of Common Hydrocarbon Fuels

[AICE 1994] [Baker 1991]

FUEL	FORMULA	FLAMMABLE LIMITS, VOL %	HEAT OF COMBUSTION, kJ/g	IGNITION TEMP, °C	BOILING POINT, °C
Methane	CH_4	5.5 – 14	55.5	650	-161
Ethane	C_2H_6	3 – 12.5	51.9	472	-89
Ethylene	C_2H_4	2.7 – 36	50.3	490	-104
Acetylene	C_2H_2	2.5 – 82	49.9	305	-84
Propane	C_3H_8	2.2 – 9.5	50.3	450	-42
Propylene	C_3H_6	2.4 – 10.1	48.9	455	-48
Propyne	C_3H_4	2.1 – 12.5	48.3	NA	-23
Octane	C_8H_{18}	1 – 6.5	47.9	NA	126

5.1 Magnitude of LNG-Air Explosion Overpressure

In order to estimate the overpressure at a given distance from a fuel-air explosion, several parameters must be defined. First, the mass of fuel within the flammability limits must be determined. To find the energy released, the mass of fuel within flammability limits is then multiplied by the heat of combustion. Finally, the velocity of combustion, or flame Mach number (Mf), must be estimated. For explosively initiated detonations, a value of 5.2 should be used for Mf.

Once the total energy release and combustion velocity are known, the scaled overpressure versus scaled distance curve given in Figure 18 can be used to estimate an overpressure at a specific distance. Within Figure 18, the curve assumes a spherical cloud geometry and single point initiation. This is not quite accurate for LNG vapor clouds, which are more disk shaped.

Most structures are significantly less resistant to internal blasts than they are to external blasts. If natural gas finds it way into a structure and then ignites, severe structural damage can occur. This is a potential concern to the LNG tanker if the spilled LNG is somehow trapped on the ship or between the hulls, as well as for nearby structures or other ships where the LNG might settle and ignite. While detonations are unlikely, some type of overpressure events could occur on a ship with a large LNG spill and provisions to prevent these types of events should be considered.

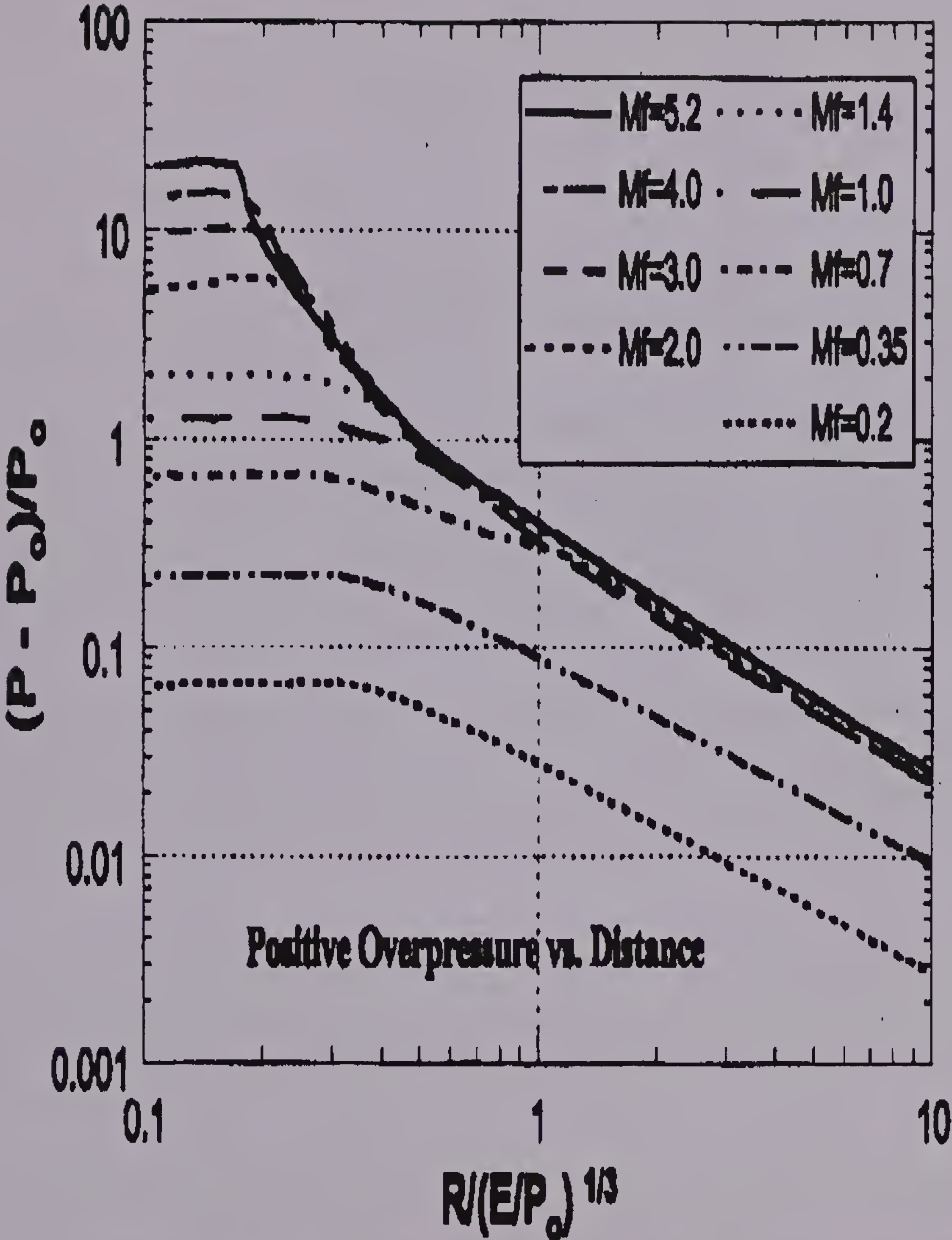


Figure 18. Scaled Blast Overpressure vs. Scaled Distance For Various Flame Mach Numbers

P = Blast overpressure, Pa
P_0 = Ambient pressure, Pa
R = Distance from explosion center, m
E = Energy released from explosion, J

[Tang 1999]

APPENDIX E
LNG PLANT EXPLOSION IN SKIKDA, ALGERIA

REPORT OF THE U.S. GOVERNMENT TEAM SITE INSPECTION OF THE SONATRACH SKIKDA LNG PLANT IN SKIKDA, ALGERIA
MARCH 12-16, 2004

EXECUTIVE SUMMARY (only)

On March 12 – 16, 2004 a six-member DOE and FERC team (U.S.G. team) visited Algeria to gain an understanding of the tragic explosion and fire at the Skikda LNG facility, which occurred on January 19, 2004.

The investigation team of the U.S. Department of Energy visited Algeria at the request of the U.S. Department of Energy and with the agreement of the Algerian Minister of Energy and Mines. A Ministry representative escorted the team to Skikda to tour the damaged facility and meet with plant management and technical staff. After returning to Algiers, the U.S.G. team met with Sonatrach Executive Vice President for Downstream Activities, Bachir Achour, who gave a broader understanding of the accident and the ongoing investigations.

Several accident investigations are ongoing. The Algerian investigation is under way, and definitive conclusions are not yet available; however, on 3/22/2004, Mr. Achour presented Sonatrach's preliminary findings at the LNG 14 conference held in Doha, Qatar. The re-insurers, including Lloyds, are also carrying out an independent investigation, and findings are not yet available.

The Skikda LNG Facility was composed of six trains; trains 40, 30, 20, and 10 are adjacent, from west to east, and are separated from trains 5 and 6, which are located remotely to the east. At the time of the accident, train 10 had been shut down for major maintenance while train 6 was shut down for regular maintenance. At the time of the accident, Train 40 had been operating at steady state for six days following routine maintenance.

A series of cascading events appear to have caused a major explosion and fire that resulted in loss of life and extensive damage. Sonatrach's preliminary hypothesis is that an undetermined hydrocarbon leak occurred in the semi-confined area between train 40's control room, boiler, and the liquefaction area. Sonatrach stated that the source of this original leak is not clear and might never be determined. The air intake to the boiler's firebox apparently ingested the fuel-air mix, causing more heat to be generated within the boiler and hence raising the internal pressure. After the boiler's pressure relief valve activated, and the operators apparently turned off the supply fuel to the boiler, the air intake fan ingested hydrocarbon/air mixture within the flammable limits. The first small explosion appears to have been in the firebox enclosure. It then breached the boiler and provided an ignition source to the external accumulation of combustible gas leading to the larger explosion.

Deaths and injuries occurred only in the plant area. Damage outside the industrial area was limited to broken windows. Most deaths and injuries were due to the impact of the major explosion and flying debris, rather than from the resulting fire. The proximity of the train 40

control room to administrative, maintenance and security/fire control buildings was a major factor in the number of injuries and fatalities.

Trains 40, 30, and 20 are virtually destroyed, although damage decreases with distance from the region between trains 30 and 40 (i.e. damage to 20 is not as severe as 40). Train 10's apparent damage was minimal (loss of aluminum insulation jacket on some process vessels), and it might be usable after further inspection. Trains 5 and 6 were not impacted except for sensitive instrumentation and detectors that must be replaced prior to resuming operation (estimated by Sonatrach to be two months). The instrumentation and electrical network on train 10 might also need to be replaced and/or rewired, as it was part of the network of instrumentation feeding data to the control room for trains 10, 20, and 30.

The U.S.G. team observations and analysis of the potential events at the plant are included in this report, as well as issues to be alert to in other plant designs and operating practices.

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August 7, 2014

Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Analyst: Anne Canaday, EEA No. 15060
100 Cambridge Street, Suite 900
Boston, MA 02114

Subject: Wynn-Everett FEIR/ EEA No. 15060

Dear Ms. Canaday:

I respectfully submit these comments regarding the Wynn-Everett FEIR, EEA No. 15060, in particular the sections in Chapter 4 concerning the sponsor's claim that 6% of the project's patrons and 3% of its employees will access their site by water transportation, a projection that I strongly dispute. Based on my experience in Boston inner harbor improvement programs as a former Massport board member and most recently as a consultant on the new Chelsea Creek vertical lift bridge, involving working closely with the key Boston Harbor regulatory agencies such as the US Coast Guard, US Army Corps of Engineers, the Massachusetts Port Authority, MassDOT and others, I estimate that the Wynn-Everett water transportation passenger ridership projections of 6% and 3% are inflated by at least 100% in both patron and employee categories, even assuming optimum year round maritime operating conditions such as weather which rarely occur.

A significant harbor transit impediment to the Wynn-Everett water ridership projections is that of the bi-weekly closure of the section of the inner harbor by liquefied natural gas carrier (LNGC) vessels supplying the LNG storage facility at the Distrigas facility in Everett located on the Mystic 1
River approach to the Wynn-Everett casino site. This bi-weekly inner harbor LNG closure is mandated by US Coast Guard regulation, specifically Title 33 of the US Code of Federal Regulations as follows:

1. No vessel is allowed within two miles ahead and one mile astern of a LNGC vessel underway, nor within 500 yards on either side of such vessel. This essentially closes the segment of the inner harbor route from the World Trade Center and Long Wharf to the Tobin Bridge that Wynn-Everett requires in their FEIR.
2. No vessel is allowed within 400 yards of an LNGC vessel moored at the Distrigas facility in Everett. This essentially closes the segment of the Mystic River required in the Wynn-Everett EIR for ferries to access their site. This condition typically lasts for 24 hours while the LNGC vessel unloads its cargo.

This regular bi-weekly LNGC inner-harbor closure alone represents approximately a 13% reduction of harbor availability for the Wynn-Everett water transportation ridership, which need to be adjusted downward accordingly. In addition to the LNGC harbor restrictions the US Coast Guard also restricts vessel traffic under the auspices of Title 33:CFR for non-LNGC reasons as required for various reasons. Overall these total harbor closures alone would reduce the availability of the inner harbor, including the Mystic River, for the Wynn-Everett FEIR water ferry route by at least 20% from the unrestricted conditions assumption on which the FEIR ridership projections are based, which need to be adjusted downward accordingly.

The complete Title 33 of the CFR is attached.

In addition to these regular harbor safety restrictions there are other maritime operational factors which I am thoroughly familiar with which are the basis of my estimate that the Wynn- 2
Everett water ridership projections are inflated by 100%.

The Wynn-Everett DEIR is also deficient in its failure to acknowledge the serious safety and environmental consequences of the Wynn-Everett casino's close proximity to the massive 3
Distrigas liquefied natural gas facility in Everett whose inherent safety is questionable enough that one of former Boston Mayor Thomas Menino's top priorities was the closure of the facility. The Distrigas facility is unique in terms of its proximity to a major urban area.

Many detailed and credible studies have been completed by highly reputable sources demonstrating the enormous potential destruction associated with an LNG vapor cloud explosion from a breached LNGC vessel, stemming from either accidental or deliberate means. One scenario shows major damage over a mile from the source. The Wynn-Everett casino would be located 4,000 ft. from an LNCC vessel moored at the Distrigas docks, and closer to the main LNG storage tanks. Please see attached aerial entitled: Wynn-LNG Distance.

Note in particular the Boston Globe graphic, based on a Sandia Laboratories study, showing that the proposed Wynn-Everett casino site lies well within the predicted 4,200 ft. radius within which 4
people would be severely injured from an LNG explosion.

I've also attached a copy of a Boston Fire Department study that shows the limitations of the department in coping with an LNG event.

Also attached are various media accounts from Boston Magazine, NBC News, etc.

I've also attached a copy of the Sandia Laboratories study at the end.

Thank you,

John Vitagliano